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AND THE

HOUSEHOLD ARTS.

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Tillage and Pasturage are the two breasts of the State.—*Sully.*

FRANK. G. RUFFIN, EDITOR. F. G. RUFFIN & N. AUGUST, PROP'RS.

VOL. XVIII. RICHMOND, VA., APRIL, 1858. NO. 4.

From the British Farmer's Magazine.

Nutrition of Plants.

Researches upon the Influence Exercised by the Soluble Nitrogen of Manures, in the Production of Vegetable Matter.

Action of Phosphate of Lime upon Vegetation, With and Without the Concurrence of Saltpetre.

Translated from the French of Boussingault.

BY M. R. DE LA TREHONNAIS.

In a memoir read to the Academy, at its sitting of the 19th of November, 1855, I demonstrated how much nitrates were favourable to vegetation. With the same meteorical conditions, in soils of similar nature, helianthuses, put to the regime of nitrate of potash, have taken a considerable development; they have elaborated 9.30 grains of albumen, and produced 108 times as much vegetable matter as was contained in the seed. Without nitre, on the contrary, when the available nitrogenous principles of the atmosphere have alone intervened, the growth of the plant was more restricted. After three months' cultivation, there was scarcely 0.465 grain of albumen formed, and the dried helianthuses weighed only three or four times as much as the seed.

The experiments made upon alenese cresses have led to similar and perhaps more certain results, because in the comparative observations, the plants had both had at their disposal in the ashes of dung added, much more mineral substances than they could absorb. But was this the case with the helianthuses? We must inquire, for instance, if, on account of the rapidity of its growth, the one which had a supply of nitrate, did really meet in the soil a sufficient quantity of phosphate of lime; and in admitting that such had been the case, we should still be justified in asserting that the development of the helianthus raised without nitrate would have been more conspicuous, and that the carbon, the nitrogen, the elements of water, would have been assimilated in larger proportions, if the plant had found in the soil as much potash as the saltpetre had supplied to the other helianthus.

It was to clear up these doubts that I undertook new researches. I was anxious, besides, to see a fresh manifestation of certain facts which had unexpectedly occurred in my former experiments—I mean the so decided action of the soluble nitrogenous principles upon the formation of the immediate organs and principles of vegetables—an action so manifest, that the weight of the organism elaborated by a plant, gives in some measure the proportion of nitrogenous manure which it has assimilated. This is so true, that a seed so minute that the proportion of albumen should scarcely be traceable—as in *Mimulus speciosus*, tobacco, &c.—produces in a barren soil a plant the development of which does not go beyond the appearance of the rudimentary leaves, and which preserves this embryonic form during whole months, awaiting the manure indispensable to constitute the nitrogenous tissue, without which it could not grow, because it can be of

no use. It is this stationary condition, this persisting germination, that for the first time I had an opportunity to observe, in 1854, upon several seeds, the weights of which ranged between 1-17th and 1-68th part of a milligrame=0.0155 grain. (*Calandrinia umbellata*, and *Campanula baldensis*.)

I have observed, besides, that extremely light seeds, weighing from 2 to 3 milligrammes, like cresses, produce, when sown upon an absolutely barren soil, slight and delicate plants—provided, however, with complete organs; but then, as it appears from all my experiments, without any exception, after several months' existence in the open air, and moreover in a confined atmosphere, the plant does not weigh much more than the seed from which it sprung; as if the extension of its organism was found limited by the quantity of nitrogenous principles contained in the seed.

Thus there are seeds which possess the nitrogenous element just necessary, without the aid of manure, to give birth to a plant excessively reduced in its dimensions, but perfectly organized, which I have designated by the name of *limit plant*, because it represents a plant constituted with the least possible matter: in it is very nearly found the nitrogen of the seed; and slight though it be, this plant blooms and bears a fruit which would want only a fertile soil to regenerate the normal plant.

The object of the experiments which I am going to describe, was at first to ascertain the action of the phosphate of lime upon vegetation with and without the help of saltpetre. I have followed the development of the *Helianthus argophyllus* in the open air, sheltered from the rain, in a soil formed of pulverized burnt clay mixed with quartzy sand. The vehicle, like the pot which contained it, had been calcined after being washed in distilled water. Three experiments, A. B. and C., were prepared. In the experiment A. nothing was added to the soil. In the experiment B. basic phosphate of lime, vegetable ashes, and nitrate of potash were added. In the experiment C., the soil received phosphate of lime, vegetable ashes, and a quantity of bicarbonate of potash, containing precisely the same alkali as in the nitrate used in the experiment B.

The phosphate of lime has been extracted from calcined bones, in using agents as pure as possible, on account of the presence of magnesia. Notwithstanding this precaution, the phosphate precipitated by the potash was not free from nitrogen: 37.82 grains of the basic salt contained 0.00341 grains of it, in a state of ammoniaco-magnesian phosphate. The phosphate was always applied to the soil in a gelatinous state, such as it was obtained upon the filter after washing. The bicarbonate of potash had been prepared with carbonate of great purity. The vegetable ashes obtained from the combustion of meadow hay were very rich in white silica, without any traces of cyanure.

The plants grew in the open air, 40 inch above the turf, near a vine planted on th border of a large forest. The water used water the plant, free from ammonia, contain about the fourth of its volume of carbonic ac gas.

The average weight of the pots was		9,300 gr
Burnt clay - - - - - -		6,200 "
Quartzy sand - - - -	2lbs.	1,903 "
Total of earthy matter interven- ing in each experiment	4lbs.	3.403 "

Experiment A.: Vegetation of the Helianthus in a soil containing nothing else but burnt cla and sand.

Two seeds of Helianthus, weighing 1.0 grains, were planted on the 5th of July.

20th August.—The first normal leaves we withered.

	Length.	Width.
Second normal leaves	7.90 eigh's in.	3.16 eigh's i
Third ditto	4.74 "	0.948 "

20th Sept.—The second normal leaves we withered.

	Length.	Width.
Third normal leaves	5.688 eigh's in.	1.58 eigh's i
Fourth ditto	2.212 "	0.948 "

Signs of a blossom bud; height of the stems and 5 inches.

30th September.—The aspect of the plan had not changed since the 20th. The bud ha burst into a tiny yellow flower, the corolla which was not more than one-eighth of an inc in diameter. This miniature flower was su rounded with nascent leaves.

A *limit* plant was obtained.

	GRAIN
The dried-up plants weighed - -	6.076
Seeds - - - - - - - -	1.658
Organic matter developed - -	4.418

It was remarked that the plants had bee pretty strong up to the 10th of August. Fro that time the older leaves withered, just as ne ones appeared; and the vigour of the vegeta tion gradually declined up to the blooming.

The analysis showed in the whole of th dried-up plant:—

Nitrogen - - - - - - -	0.052
In the soil - - - - -	0.031
Total - - - - -	0.083
Nitrogen obtained after 3 months' vege- tation in the open air - - -	0.035

Valuation of the carbon fixed during vegeta tion.—The matter organized during vegetatio weighed 4.4175 grains, from analysis made o plants grown in the same condition. It con tained at the degree of dryness to which it ha been brought 0.40 of carbon, say 1.767 grains This carbon, which could have no other origi but carbonic acid, represented 6.479 grains, o 83.345 cubic inches of acid gas.

As the vegetation lasted 86 days, we may conclude that every 24 hours, on an average, the Helianthuses have assimilated the carbon of 7.742 cubic eighths of an inch of carbonic acid gas.

Experiment B.: Vegetation of the Helianthuses under the influence of phosphate of lime, ashes, and saltpetre.

The soil was exactly constituted in weight and nature as in the foregoing experiment. There was introduced into it

	Grains.
Phosphate of lime	155.00
Ashes	23,25
Nitrate of potash successively added	21.07
Containing	
Soluble nitrogen	3.05195
Potash	10.11375

On the 5th of July two Helianthus seeds were sown in the soil, suitably moistened, the seeds weighing 1.6585 grains.

On the 20th of August the first normal leaves were withered.

	Length.	Width.
Second normal leaves	3½ in.	2¼ in.
Third ditto	3⅝	2⅝
Fourth ditto	3⅝	2⅝
Fifth ditto	pretty well developed. Diameter of the stems 2.528 eights of an inch.	

September 10.—Height of the plants, 19 and 23 in.; diameter of the stems, 2.895 eighths of an inch.

September 20.—Height of the plants, 25 2-8ths in. and 29 2-8th in.; diameter of the stems, 3.16 eighths of an inch.

September 30.—Height of the plants, 64 and 74 centimetres; diameter of the stems, 3.16 eighths of an inch. The larger Helianthus bore a beautiful yellow flower, the corolla of which had a diameter of 3½ inches. Since the 20th of August the leaves had not sensibly changed in their appearance. The largest presented a surface nearly equal to that of a Helianthus Argophylus grown in garden soil.

The dried-up plants weighed:	Grains.	
Stems	134.152	
Leaves and flowers	109.934	
Roots	85.792	
		329.878
Seeds		1.658
Organic matter developed		328.220

Analysis made upon 46.5 grains of the matter, indicated that the 329.878 grains of dried-up plants must contain:—

	Grains.
Nitrogen	2.63035
The two seeds contained	0.04805
Nitrogen got in 3 months' vegetation	2.58230
1.25 grains of nitrate of potash added to the soil contained:—Nitrogen	3.05195
Difference	0.46965

There was then 0.46965 grains of nitrogen in the soluble manure, which the Helianthus did not free: nitrogen representing 3.3945 grains of nitrate of potash, of which part was found in the soil; the other part had formed some carbonate of potash, owing to the action exercised by the organic matter of the roots, an action already recognized by M. Schlœsing, and which is accounted for by the facts recently published by M. Pelouze.

The examination of the ashes showed that the plants had taken from the soil 4.1075 grains of phosphate of lime.

Carbon fixed during vegetation.—The 328.220 grains of organic matter contained 130.8820 grains of carbonic acid. Vegetation having lasted 86 days, the Helianthuses under the double influence of the saltpetre and phosphate of lime, took every 24 hours, on an average, the carbon of 72 cubic inches of carbonic acid gas.

Experiment C.: Vegetation of the Helianthuses under the influence of the phosphate of lime, ashes, and bicarbonate of potash.

We have just seen that the introduction of saltpetre, combined with phosphate of lime in the soil, determined a considerable development of organic matter, and the assimilation of more than 130 grains of carbon. The Helianthuses grown in these conditions presented nearly the same aspect, and the same vigour as those which had been cultivated in the open ground. A complete manure, in which the plants found all they wanted, was then formed from the combination of nitre with the phosphate and the ashes.

The experiment C. was undertaken to ascertain what share of influence upon vegetable production must be attributed to the phosphate of lime. To that effect, the saltpetre was suppressed; but as this suppression did away with a considerable quantity of alkaline matter, the nitre which had been used in the experiment B. was replaced by its equivalent of bicarbonate of potash—a salt much less alkaline than the carbonate. It is, besides, the bicarbonate that is found in the dung and the urine which herbivorous animals drop upon their pasture.

The constitution of the soil, in the two experiments B. and C., was as follows:

	Exper. B. Grains.	Exper. C. Grains.
Earthenware	9.300	9.300
Broken bricks	6.200	6.200
Quartzy sand	159.030	159.030
	174.530	174.530
Phosphate of lime	155.000	155.000
Ashes	7.750	7.750
Nitrate of potash 21.7 gr. and bicarbonate of potash 19.530 Containing:		
Potash	10.1060	10.1060
Soluble nitrogen	3.0535	—

Everything in both soils was then equal on either side, with the exception of the soluble nitrogen of the nitric acid, which was wanting in the experiment C.

On the 5th of July, two seeds of helianthus, weighing 1.6585 grains, were sown.

On the 20th of August, the first normal leaves were withered.

	Length.	Width.
2nd normal leaves	3.16 8ths of in.	1.000 8th of in.
4th "	2.84 "	1.000 "
5th "	1.58 "	0.632 "

These leaves were of a very pale green.

Each of the plants bore a bud—height 43 and 44 eighths of an inch, the diameter of the stems 0.316 eighth of an inch.

On the 30th of September the plants had not changed their appearance since the 20th. Both had a yellow flower, extremely small, but well formed. Just as in the experiment A., in which nothing had been put in the soil, *limit plants* were obtained.

	Grains.
The two dried-up plants weighed -	7.7190
The seeds - - - - - -	1.6585
Organic matter developed - -	6.0605

As in the experiment A., the plants remained pretty strong up to a couple of months. Afterwards, the leaves withered towards the lower end of the stem, and the strength of vegetation rapidly decreased.

Analysis showed in the dried-up Plants and in the Remains left in the Soil:—

	Grains.
Nitrogen - - - - - - -	0.08990
Found in the seeds - - - -	0.04805
Nitrogen acquired in three months of vegetation in the open air - -	0.04185

CARBON FIXED DURING VEGETATION.

The organic matter weighed 6.0605 grains. Admitting 0.40 for the proportion of carbon, we find 2.4242 grains for the weight of that substance, or 913.24 cubic eighths of an inch of carbonic acid gas.

Vegetation having lasted 86 days, the plants must have assimilated, every 24 hours, on an average, the carbon of 10.2334 cubic eighths of an inch of carbonic acid gas. It is within 3.16 eighths of an inch of what the helianthuses had assimilated in the experiment A.

I shall resume here the facts elicited by the three experiments:

	Weight of the dried Produce, the Seed being 1.	Vegetable Matter formed.	Carbonic Acid Gas decomposed by the Plants every 24 Hours.
	Grains.	Grains.	Cubic 8ths of an Inch.
Experiment A—The soil having had nothing -	3.6	4.4175	7.742
Experiment B—The soil having received phosphate, ashes, nitrate of potash - - -	198.3	237.2205	568.80
Experiment C—The soil having received phosphate, ashes, bicarbonate of potash - -	4.6	5.0605	10.80

ABSORBED BY THE PLANTS IN EIGHTY-SIX DAYS OF VEGETATION.

	Carbon. Grains.	Nitrogen. Grains.
Experiment A—Soil having had noihing - - - -	1.7670	0.03565
Experiment B—Soil having received phosphate, ashes, nitrate of potash - - - - - - - - - - -	130.8820	2.58230
Experiment C—Soil having received phosphate, ashes, bicarbonate of potash - - - - - - - - -	2.4180	0.04185

The influence of nitrous manure upon the development of vegetable organism is now proved in the clearest manner. The helianthuses grown in a soil treated with saltpetre and phosphate, reached the same growth as they would have done in a fertile soil. They assimilated 130.82 grains of carbon. Seeds containing only 0.2945 grains of albumen, produced, owing to the effect of saltpetre, plants in which there were more than 15.5 grains of that substance.

In a soil destitute of any nitrous matter, with or without the presence of phosphate of lime and the alkaline salts, the helianthus did not grow much beyond five inches. In acting upon the carbonic acid of the air, scattered in or dissolved in water, they did not even assimilate 3 grains of carbon; and the nitrous principles of the atmosphere which intervened in these circumstances did not impart to the plants more than 0.0465 grains of nitrogen. These results prove that, in order to help actively vegetable production, Basic phosphate of lime and alkaline salts must be associated to a substance containing some soluble nitrogen. Farmyard manure, especially, generally offers this kind of association.

In these experiments, when saltpetre was not used, the 0.033 and 0.0465 grain of nitrogen acquired by the plants after three months' vegetation, very probably came from the ammoniacal vapours arising from the nitrous compounds existing or forming in the atmosphere. I have succeeded in detecting their

presence in the atmosphere by the means I will now describe:

APPARATUS TO DETERMINE THE APPEARANCE OF NITRATES.

Six tubes in the shape of an U were placed, one after the other, in connection with an aspirator. The two first tubes, through which the inhaled air passed first, were filled with small fragments of brick, impregnated with a solution of carbonate of potash.* Afterwards came two tubes filled with alkaline pumice stones; then, last of all, two other tubes, which contained chalk soaked with a solution of carbonate of potash. The apparatus was sheltered from the rain in a box, in which air was let in at three inches above the turf, close to a vine.

The aspirator worked almost without any interruption, night and day, from the 7th of July to the 7th of October, 1856. The matter contained in the tubes was kept in a constant state of humidity. The experiment being finished, a very appreciable quantity of nitrate was found in the first tube. There was still a trace of that salt in the second tube, and not at all in the others; at all events, not the least trace was perceived, although, on the one hand, the tincture of indigo, and on the other the gold leaf, are capable of detecting clearly .00275 of a grain of nitric acid.

The aspired air came directly into the first tube, in which fragments of bricks, imbibed with a solution of carbonate of potash, were placed. I did not think it necessary to make it pass through sulphuric pumice stone to retain the ammoniacal vapour. What I wanted to detect was simply the presence or the absence of nitrate in an earthy substance, porous in its nature, imbibed with dissolved carbonate of potash, and submitted to a current of air. Whatever the cause may have been, there undoubtedly was an appearance of nitrate. I say appearance, and not production, because the experiment, such as it had been conducted, did not demonstrate anything else. In effect, if it be possible that the ammonia of the air which was not removed had been nitrified by the contact of the potash, mixed with the porous body by some ozoned oxygen, it is not unlikely, on the other hand, that some nitrates may have been brought with the dust, which the atmosphere always holds in suspension. Saltpetre is everywhere on the surface of the globe; the most minute particles of the vegetable earth which the wind carries about are evidently provided with it, and the air brought into the apparatus may have deposited some upon the damp bricks of the first tubes. I must observe here, that if even air had been at first directed upon sulphuric pumice stones, in order to fix the ammonia, this means would not have prevented the nitrates from intervening, for, insomuch as they are concerned, the action of the sulphuric acid would have been confined to keeping their basis; and the nitric acid, freed or transformed into nitrous compounds, would have been carried away by the current, and retained by the potash of the first tubes.

However that may be, and in considering solely the fact of the appearance of nitre where there was none before the passage of air, it will be acknowledged that this experiment, made above a turf near a vine, and upon the border of an immense forest, leads to a result quite conformable to that obtained long before by M. de Luca, in similar circumstances as regards the abundance of vegetation, since that eminent observer has found that there is a formation of nitric acid when air deprived of ammonia, free from dust, and taken from a greenhouse where many plants of all kinds are grown, is passed through a solution of potash.

DETERMINATION OF THE NITROGEN AFFORDED BY THE ATMOSPHERE.

A cylindric vase, made of crystal, one inch and a half deep, and presenting a surface equal to that of flower pots, were placed near the plants under experiment. Half a pound of washed and calcined sand, to which had been mixed 155 grains of oxalic acid, considered as pure, but containing in reality 0.001705 grain of nitrogen, which was accounted for, was placed into it. The mixture, kept damp, remained exposed to the atmosphere. When it rained, and during the night, to avoid the dew, the vase was covered with a glass bell. After seven weeks the sand had absorbed 0.003015 grain of nitrogen, a part of which certainly formed some ammonia. This is, however, a mere information, for everything leads to the presumption that the quantity of nitrous principles which a damp soil receives from the atmosphere, depends at the same time upon the surface exposed, and the length of time of the exposure, and also upon the locality. Upon the locality: this is a circumstance which must not be overlooked, for air is not always equally pure. The impurity of rain-water demonstrates, perhaps, better than the most delicate analysis could do, the degree of impurity of the atmosphere. It is thus that the rain-water collected at Paris and Lyons contain much more ammonia, nitrates, and organic matters,

* The fragments came from a new brick, but which had been deposited for a long time in a warehouse. They had been washed with distilled water, before they were calcined, in order to take away the nitrates which they might have contained, and which, calcination without charcoal does not always completely destroy, or rather transforms into nitrate or other very persisting nitrous compounds. The carbonate of potash had been prepared by reducing to ashes pure cream of tartar; and care had been taken to ascertain that it did not contain the slightest trace of nitrate.

than the rain, snow, fog, and dew which fall at a great distance from centres of population.*

INFLUENCE OF THE SOLUBLE NITROGEN UPON THE DEVELOPMENT OF VEGETABLE ORGANISM.

The preceding experiments have established that the phosphate of lime and the alkaline salts added to the soil, without the concurrence of a nitrous manure, do not sensibly contribute to the development of organism. The matter formed in that condition by the plant does not weigh much more than that which is produced when the ground, rendered barren by fire, contains no saline substance; when, for instance, vegetation is accomplished with the only resources which are found in the seed, and ends only in a *limit plant*. When, on the contrary, phosphate and saltpetre are united, they act with the energy of farm-yard manure. I believe it is permitted to conclude from those facts, that the growth of a plant is subordinate to the previous absorption of a soluble nitrogenous substance, the effects of which it is not perhaps impossible to calculate: it is at least what I have attempted.

To that end divers preparations of nitrate of soda were introduced into calcined sand provided with phosphate of lime and salts of potash.

The soil, calcined and improved with phosphate, was divided and put into four flower vases, free from every organic matter.

Two seeds of Helianthus argophyllus, weighing 1.7050 grains, were placed into each of the vases.

The vegetation lasted fifty days.

The water of irrigation, free from ammonia, had about the fourth part of its volume of carbonic acid gas.

The plants were grown in the open air, sheltered from the rain and dew.

The soil of the vase No. 1 had no nitrate of soda.
The soil of the vase No. 2 had 0.310 grains.
The soil of the vase No. 3 had 0.620 "
The soil of the vase No. 4 had 2.480 "

During vegetation the plants remained very strong, the leaves were of a fine green. Here are their respective dimensions at the end of the experiment.

		Height.	Length of the largest leaf.	Width of the largest leaf.	Weight of the dried-up plants.
No. 1	without nitrate.	4 inches	1½ inches	4.70 8ths of inch.	7.055 grs,
2	with nitrt. 0.310 gr.	4½ inches	2 inches	6.30	13.000 grs.
3	with nitrt. 0.620 gr.	4⅝ inches	2⅝ inches	1 inch	19.022 grs.
4	with nitrt. 2.480 gr.	9 inches	3⅝ inches	1½ inch	52.545 grs.

By taking off the weight of the seeds from the weight of the dried plants, we find that the organic matter elaborated during vegetation was as follows:

Organic matter formed by No. 1, not having received any soluble nitrogen - -	6.045 grains.
By No. 2 having rec'd 0.05115 grain of soluble nitrogen -	11.2685 "
By No. 3 having rec'd 0.10230 grain of soluble nitrogen -	17.545 "
By No. 4 having rec'd 0.4312 grain of soluble nitrogen -	50.84 "

The influence of the soluble nitrogen was manifest, and it was not without astonishment that in the experiment No. 2 we found that 0.05115 grain only of nitrogen introduced into the soil was sufficient to increase two-folds the organic matter of the Helianthuses; also the proportion of the weight of the seed to that which was : : 1 : 4.6 of the dried crop in the cultivation of which no nitrate had been used, became—

: : 1 : 7.6 in cultivation No. 2, as above.
: : 1 : 11.3 in cultivation No. 3, "
: : 1 : 30.8 in cultivation No. 4, "

The analysis showed in the helianthuses No. 1 grown in the soil without any nitrate of soda.

Nitrogen - - - - -	0.08215 grain.
In the seeds there was, nitrogen	0.05115 "
Nitrogen generated in fifty days' vegetation - - - -	0.03100 "

For the plants grown in a soil to which nitre had been applied, the quantities of nitrogen found led to the following results:—

	Nitrate added.	Nitrogen contained in the nitrate and the seed.	Nitrogen, found in the plants.
Helianthus No. 2,	0.310 gr.	0.10230 gr.	0.09610 gr.
Helianthus No. 3,	0.620 "	0.15500 "	0.15035 "
Helianthus No. 4,	2.480 "	0.46035 "	0.38905 "

Traces of nitric acid were found in the soil of experiment No. 2 and No. 3. In the soil of experiment No. 4 there was a less than 0.465 grain of nitrate of soda; and in none of the

*From observations made by M. Barral, at Paris, and M. Birreau, at Lyons; compared with those I have obtained at Liebfurnenberg, and those of Messrs. Lawes and Gilbert, registered at Rothamstead.

plants submitted to the action of that salt, did the nitrogen assimilated by the organism exceed that which the nitrate had introduced.

What is most striking in this second series of experiment, is to show not only as much a nitrogenous substance introduced into the soil contributes to the growth of the plant, but to demonstrate besides how much the organic matter elaborated by the plant increases through the intervention of the smallest quantity of soluble nitrogen.

One may also convince himself by examining the figures expressing the quantity of carbon fixed by the helianthus, that the decomposition of the carbonic acid gas was so much the more conspicuous, as the plant had at its disposal a greater quantity of nitrate of soda, or, in other terms, more nitrous manures.

Experiments.	Nitrogen contained in the seeds weighing 1.705 grains.	Nitrogen introduced by the nitrate.	Organic matter formed in fifty days' vegetation.
No. 1,	0.05115 gr.	0.00006 gr.	6.1535 gr.
No. 2,	0.05115 gr.	0.05115 gr.	11.1600 gr.
No. 3,	0.05115 gr.	0.10230 gr.	17.5150 gr.
No. 4,	0.05115 gr.	0.40920 gr.	50.8400 gr.

Experiments.	Carbon contained in the organic matter.	Average of carbonic acid decomposed in 24 hours.
No. 1,	2.4645 grains.	2½ cubic inches.
No. 2,	4.4640 "	4½ "
No. 3,	7.0060 "	6⅝ "
No. 4,	20 3360 "	17 "

From the whole of these researches it follows—

1st. That phosphate of lime, the earthy and alcaline salts indispensable to the constitution of plants, exercise, however, no action upon vegetation, except when they are combined with matters capable of yielding soluble nitrogen:

2nd. That those soluble nitrous matters which the atmosphere contains, intervene in too small a proportion to determine, in the absence of a nitrous manure, an abundant and rapid vegetable production:

3rd. That saltpetre combined with phosphate of lime and silicate of potash, acts as a complete manure, since helianthuses grown under the influence of that mixture, for vigour and size bear a comparison with those which had been grown upon a garden strip strongly manured.

I will add, in conclusion, that it is very remarkable to see a plant going through all the phases of vegetable life, germinate and ripen—in one word, attain its normal development, when its roots are growing in a calcined sand containing, instead of organic *debris* in a state of decomposition, salts of a great purity, combined substances perfectly defined, such as nitrate of potash, basic phosphate of lime, alkaline silicates; and to ascertain that by means of those auxiliaries, all taken from the mineral kingdom, this plant progressively increases the weight of its organism by fixing the carbon of carbonic acid, the elements of water, and by elaborating with the radical of nitric acid, albumen, caseine, &c., that is to say, the nitrogenous principles of milk, blood, and muscular flesh. On the other hand, there is probably more analogy than may be supposed between the salts I have just mentioned and manure. Dung, in which Braconnot did not find less than fourteen substances, singularly changes its constitution when it has sojourned in a soil suitably pulverized. Fermentation persisting in the soft parts, the slow combustion which humus, black earths, those advanced terms of the decomposition of organized bodies and the dejections of animals undergo. The action which air, water, soil, exercise upon all these matters, are, after all, so many causes why dung gives to the plants alkaline and earthy salts, phosphates, and, as recipients of soluble nitrogen, nitrates and ammonia.

For the Southern Planter.

Culture of Apple Trees.

To the Editor of the Southern Planter:

Sir—In the last few numbers of the Planter I have observed a bit of a controversy between a pair of amateurs, relative to the culture of apple trees. In reading these well-written articles, one would be struck with the apparent seriousness of the combatants, but in analyzing the matter, one cannot fail to perceive the hollowness and want of practical information on the subject under dispute. Now, it is not my purpose to follow either of these two Tyroes in these barren and superabundant wanderings, for on reflection it will be obvious that both are oblivious as regards the true merits of the case. Thus is the analogy of the wheat plant, an annual grass which grows out of the graves of the martyred dead at Waterloo, brought forward as an illustration to the arborescent apple, whose age marks one thousand years. The writer ought to select kindred species, for he should know that there is no

physical analogy between these two plants; or in plainer words, they cannot be allied by cross impregnation; or were we to examine the medullery veins, organs and ramifications of the wheat and apple plants, we would invariably fail to establish the semblance of a criterion by which to judge of these defects and remedies. This root-pruning, ringing, boring, plug-driving and so-forth, was known to Virgil and Columella; and though the thing has been practiced somewhat from the days of these sages to this day, we are as ignorant of its utility now as our great ancestors were in those times termed the dark ages. Why, those articles seem to be written more in the spirit of a stump orator than a searcher after truth, or an investigator of cause and effect. The glow of individual triumph seems to embellish every line written, and therefore I agree to the chiselling off of the tap root, to induce fruitfulness in the writers, for there seems to be an extravagant superfluity of matter in their compositions, as well as a barrenness of ideas; however, as I have already hinted, it is not my intention to enter on the same train of superficial reasoning with these gentlemen, for it is useless to be wasting words with men who cannot distinguish wood from straw, or blossoms from roots. The inquiry is not so much whether root-cutting will induce fruitfulness in the one case, or the application of manure in the other; for any one may observe examples of both in a green spot of ground, where the most exact scrutiny cannot discover the smallest difference in the texture, or component parts of the soil in which these trees grow; and yet the one is barren and the other thrifty, luxuriant, with such a superabundance of sap in its stem, branches, and extremities, as to render it unproductive; also, therefore, I argue, that the secret must lie elsewhere than in chopping off the roots or applying a load of manure. We must have recourse to the physical structure of the plant, for a physical want requires a physical remedy. Thus, then, do I submit for consideration, whether the spongioles, or most minute fibres which absorb the nutriment from the soil, have the power of taking that and so much as is useful and necessary, and rejecting all extraneous matter. The cutting off of the roots will, after a little while, increase the spongioles ten fold, and of course a ten fold agency will be added to the absorbant principles. So your pruning at the roots is a sublunary dream; besides, it may engender many diseases which have been hidden from the eye, spread its corroding influence over the entire plant, and eventually a sudden collapse or death ensues.

R. C.

March 12th, 1858.

The following communication was misplaced soon after it reached us. But it is still in time. But those gentlemen who feel the burden of a fence can now by association, and by availing themselves of the Bill we published in our last number as a model, get rid of it. Only do not let the company be too large at first. The number might scare some of those timid members of the Legislature; who, as our friend, Mr. Marshall of Charlotte, says, "always get poked by a poor man's cow on election day."

[Ed. So. Pl.

For the Southern Planter.

Fencing.

Mr. Editor:

We were just preparing a memorial in this county for the Legislature to alleviate the burthens of fencing, for they were getting too grievous to be borne, especially by the poor, owning or working small farms. For it had just occurred to us that our rich neighbour encloses his four hundred acres with just double the quantity of rails we take to enclose one hundred acres. And the larger farmer of sixteen hundred acres, at only four times the number; increasing in a sort of geometrical progression against the small farms. But we shall cease to complain if Mr. Za. Drummond will explain to us his one log fence, spoken of in the January number. One log in the "small trench in the earth," and one above; "and if your logs are large your fence is complete." A log from four to five feet in diameter?!!

He says, "a fence of logs running up hill (perpendicular) cannot be made to stand." What do you want with a fence on a "(perpendicular)" cliff, or bluff? If he means only a steep hill, I think by notching the undersides of the long logs, so as to prevent their slipping endwise down the hill, a fence might be made to stand, especially if staked. What does he mean by "the ends touching"? Must the ends meet so as to touch; or must they pass each other and the sides come in contact? If the latter, must they lap from four to six feet, where the "blocks or cross logs" are placed "immediately above, so that gravity may be equalized," as Mr. Drummond says.

He tells us, "no matter how knotty, crooked or twisting the log," &c. Please tell us had the crook better be in or out, up or down, so that "no pig can pass it," as Mr. Drummond says.

But why not build a cheap board fence, like Mr. E. S. Buck recommends in the same No. of the Planter, page 33, with posts smaller than the stakes? Will the stakes last in the ground any longer than the posts would? The plan, I dare say, is more suitable for repairs than a new fence. So come on, Mr. Drummond, with your one log fence, and let us hear all about it, and we will have one at

ROUGH CREEK.

For the Southern Planter.

Clear the Tract for Reapers and Mowers.

Mr. Editor:

Out of ninety-three reaping and mowing machines, patented by different persons in the United States, it is to be presumed that many will be used in future in this State for securing hay and grain. Those who wish to pass through their hay and grain harvests without much vexation and loss; will not permit *March* and *April* to pass without cleaning their fields and meadows of *stone*, *sticks*, loose *stumps*, *snags*, *old bones*, &c.; and also placing a stake, five feet high, firmly in the ground, by the side of every stump, small or large. Small stumps are more dangerous than large ones.

March 2nd, 1858. EXPERIENCE.

For the So. Planter.

Reply to "Roofs and Roofing."

The February No. of the Planter contains three selected articles on "Roofs and Roofing," one from Maine, one from Massachusetts, and one from New York. Covering houses with shingles appears to be such a simple operation in itself, and has been so long practiced, that upon the principle that "practice makes perfect," we might conclude that if there was any one subject upon which no information was needed, it was this one of "roofs and roofing." But the articles alluded to above, establish at least one fact, and that is, that there still exists considerable diversity, both in theory and practice, upon this important subject.

The statement of the "Maine Farmer" that roofs in that wooded region scarcely last beyond ten years, surprises me much. It certainly falls far below the average duration of shingle roofs in this part of Virginia. I know roofs of white pine shingles put on thirty years ago that are yet sound and good, and in that time have not required the expenditure of a dollar in repairs. There is no kind of timber in this region from which shingles can be made, that will not last more than ten years.—Your "old-field pine" and our "gum" would, under favorable circumstances, remain sound that length of time.

The superior durability of our shingles may, perhaps, be due to the fact that this part of the world is not yet blessed with a "shingle machine," as a permanent institution. I remember that some years ago one was exhibited in this county as a "show," but it soon left for "parts unknown." And we continue to do with our shingles as we are obliged to do with our notes, have them "shaved."

The complaints and objections so vehemently urged against what is denominated "close boarding," preparatory to shingling, appears to me to be unfounded, where the roof is well put on. The principal objection to this plan is said to be, that it prevents the roof from drying readily after a rain. Now a roof that becomes so thoroughly wet either by absorption or leakage as to require ventilation in order to dry the inside, is not worth preservation, it will soon cease to protect the inmates of the building from the rains. The underside of a close roof cannot get wet; there is, therefore, no necessity for ventilation in order to dry it.

One of the articles alluded to recommends that shingles be made from one-quarter to half an inch narrower at the butt end than at the top. For this recommendation no reason is assigned. And it is not only in conflict with the general practice, but to me, appears to be equally so with sound reason and common sense.—The most important end to be sought for in a roof is closeness and tightness. The effect, however, of making shingles of less width at the butt than the top would be to have openings of from $\frac{1}{4}$ to $\frac{1}{2}$ inch between the shingles when the roof was first put on, and they would continue to increase every year. The best method is to have the shingle of exactly the same width at both ends, but if there is any difference, the butt ought to be the widest. There are several other statements in these articles that I deem fallacies, but I shall forbear to notice them.

My apology for this article is that I am unwilling to see novel errors introduced from a distance into our practice on this matter or the old methods sustained by unsound reasons, without at least a protest against them.

I am very sorry I have not some novel and unheard-of mode of shingling houses to recommend to the farmers of Virginia, through the Planter. I must therefore content myself with a very brief statement of what is the general practice in this part of the State, where roofs certainly last, on an average, more than ten years. The kind of timber mostly used for shingles is white pine; other kinds, however, are frequently used. Yellow poplar (tulip tree) makes a very superior shingle, and shingles made from white oak (if the trees are old) make an excellent roof. I have one side of a large barn covered with white oak shingles, which have been on more than ten years, and are yet perfectly sound, and I doubt not will be so at the expiration of another decade. The usual length of shingles is 18 inches, width 3 or 4 inches, and when driven, one third of the shingle is exposed to the weather.

There are two modes of preparing the roof for receiving the shingles, one is called "lathing," and the other "sheeting."

In the former the laths are three inches wide, one inch thick, and are nailed on the rafters three inches apart. In "sheeting" boards of any width are used, generally bark-edged plank and they are put on, leaving spaces between them of about three inches, whichever mode is most convenient is adopted—both being esteemed equally good.

An important matter in roofing, especially if the shingles are made of soft wood, is to select

nails with *broad heads*—small headed nails, if they are driven tight, are apt to go through the shingle, and thus leave it loose to be blown off by high winds.

For farm buildings "lap shingles" are frequently used, made from either white or black oak. They make an excellent and cheap roof.

T.

Augusta Co., Feb. 25, 1858.

For the Planter.

Ornithological Sketches---No. 3.

My Dear Sir:

The swallows are certainly among the most interesting birds of our country. Naturalists describe seven varieties of this family, viz: The purple martin Hirundo purpurea, white-bellied swallow, H. bicolor, barn swallow H. rustica, bank swallow, H. riparia, cliff swallow, H. fulva, Violet green swallow, H. thalassina, rough-winged swallow, H. serripennis. The chimney swallow or American swift is not of the family of swallows at all; but of the cypselinæ or swifts; and it is the only genus that we have of that family in the United States. It is very possible that the numbers of swallows and swifts will be added to by new discoveries, if it has not already been done unknown to me.

The first four species of swallows are all that visit King William. And in all my letters to you about birds, I wish my remarks to be understood with reference to this county alone; or rather to my own farm. For my opportunities of locomotion have been exceedingly restricted. There may be many birds in so long a county as this of whose existence I am ignorant.

The white-bellied swallow never builds here, that I am aware of. They pass here in considerable flocks in April or May, and return in much larger numbers in September. They may be seen sweeping over our fallow-fields in October, during the wheat-seeding season. They are then very fat, and can be easily shot on the wing by a little practice. The barn swallows sometimes build here; though not often. They are prettier than the white-bellied swallows. Their breasts, bellies and under-wing coverts being the color of a robbin's breast. Their upper parts, and a band on the neck, are of a beautiful glossy blue. The two outside feathers of the tail are very long, whilst the inner ones are very short; this gives them a very forked tail. They build generally on the collar-beams in barns and out-houses. I do not know if they are not the fastest flyers on our Continent. During the cold weather in the close of April and beginning of May, 1857, many of them perished with cold. They became so gentle that, in a field where I was hauling out manure, they would come so close to me, balancing themselves on their wings, that I could see the pupils of their eyes. They would fly around the mules and horses and oxen as if they wished to gather warmth or insects from their bodies, often settling on the cows that were walking or lying down; and in two instances on hogs. When they would fly they did not appear to move far enough above the surface of the ground to keep the ends of their wings from occasionally striking it. Many of them were picked up by the servants dead.

The bank swallow or sand martin occasionally builds with us. For many years some 3 or 4 pair had nests on the banks of the road between this and Brandywine. These banks were 6 or 8 feet high, and perpendicular. They were composed of stiff clay intermixed with gravel; and were formed by the rains washing away the road, which had worn down into a deep track, barely wide enough for carriages to pass. How the birds managed to perforate these hard banks is what has sorely puzzled me. I was appointed surveyor of this road, and finding it necessary to widen it, I was unable to dig down the banks even with grubbing hoes, and had to use marl picks. I think I examined 5 holes, and they gradually ascended into the bank, to the distance of 3 or 4 feet. This was done in March, and I expected the birds would perforate new holes—they came again, but I suppose, knowing from former experience, the difficult job that lay before them, they all left. Nor do I recollect having seen one since.

As a general rule, birds that build in holes, or hollow trees in the wilderness, will build in boxes, and will greatly increase as the country is peopled, if boxes are provided for them. They also generally feed on insects, and are not at all injurious to man, but on the other hand, highly beneficial; it is instinctive in them to court his society, or rather to seek his habitation in order to find a suitable one for themselves. In this manner, after a lapse of years, their habits are much changed; they are half civilized, and become incapable, to a great extent, of providing nests for themselves. What would become of the millions of swifts that now twitter over our cities and enliven our farmsteads by their rapid, but graceful sweeps if the entrances to all the chimneys were closed in one season! Yet the time has not been very remote when there were no chimneys for them to build in. Within the memory of man, at least in the upper portion of the State, they built in large hollow trees, whose tops were broken off. There is, or 25 years ago there was, on the banks of the Irvine (vulgarly called Smith's) river, in the county of Henry, an immense sycamore, with a narrow entrance into a vast hollow. In this I have stood with a fence rail 11½ feet long in my hand, and turned it around in a circle, holding it by its middle, without touching the sides of the tree. Some 50 or 60 feet from the ground, its top was broken off—numerous sprouts put out just below, affording sufficient sap to keep it alive. Often of a summer's evening when a school boy, would I stand on

the opposite bank of the lovely little river and watch the evolutions of the swifts as they descended through the hollow top to roost. They built there in prodigious numbers, and continued to do so till a tenant converted the tree to the purposes of a tobacco house. A most excellent one it was, too, to cure tobacco in. It stood on the land of the Hon. Wm. B. Preston, and may be standing now for ought I know. But I suppose not, as the fire used for curing the tobacco must have killed it.

How would our purple martin, who has his little box or gourd put up on every farm, fare if these were all knocked down? There are many other birds that are rapidly changing their habits, and becoming more dependent on man. The white-bellied swallow, *Hirundo bicolor*, is now, in our Eastern States, quitting his hollow trees, and building like his relative, the purple martin, in boxes and jars. There is an evident desire on the part of the great crested flycatcher, and crested titmouse, to throw themselves on the aid of man. At least for twelve years they have thrown themselves upon my hospitality, so that I have to make boxes for them. And even the little black capped titmouse came the last season and took one for himself. Nor is it an unreasonable request, as we have felled the forests, and destroyed the hollows which nature provided for them. Besides, we have departed from the old practice of girdling trees. In these the myriads of woodpeckers that use to throng the land, left deserted holes enough for all those birds which are unable to form them for themselves. We are experiencing the sad consequences of our neglect in this respect. For the Philistines be upon us in the millions of swarming insects that are devouring the fruits of our toil. He who made us, made the birds also. In giving us dominion over them, it was not given for the purpose of our abusing it so as to destroy their race, and make a break in the link of creation. Nor has our Maker thought it beneath his notice to make laws for their preservation, (Deut. xxii: 6, 7,) and he adds the same blessing to those who shall observe that law as he does to the honoring of father and mother—"that it may be well with thee, and that thou mayst prolong thy days." That close and accurate observer of nature, the author of the 104th Psalm, whom I suppose to be David, says: "The Lord hath planted the cedars of Lebanon, where the birds make their nests; and he sendeth the spring into the valleys which run among the hills, by them shall the fowls of the heaven have their habitation, which sing among the branches." But whilst He has furnished these suitable habitations for the feathered tribes, as an example to man, he has permitted them to nestle in the places where was his visible dwelling on earth. "Yea the sparrow hath found an house, and the swallow a nest for herself, where she may lay her young, even thine altars, oh Lord of hosts, my king, and my God."

But where did the martins find houses for themselves before our country was settled? Only in very rare instances except when driven from their boxes by violence, have they ever been seen to build in woodpecker's holes; nor could there have been a sufficiency of these to accommodate their vast numbers. It is true, I have seen it stated somewhere, that the Indians hung up calabashes at their lodges for them before the arrival of the whites, and the latter adopted the practice from them. But the gourds, put up at the few stationary wigwams of the wandering savages, could not have bred 100,000 martins in the whole district, now composing the United States. The martins must, then, either not have been near so numerous as they now are, or they must have had some other mode of building. I suspect both to have been the case. It would not be a wide calculation to say that there are more martins raised every year in *Virginia* than there are people in it, if we consider that at nearly every house there is a martin box, and that many of the negroes put up gourds for them that they may protect their chickens from the ravages of the hawks. That the martin built like the swift, in the sides of hollow trees, cannot well be supposed. For their saliva is not sufficiently glutinous to cause their nests to adhere; nor have they spines at the end of their tails to enable them to stay themselves without good foothold, whilst building. Their nests must have been composed like those of the barn swallows, of mud and grass. And these must have been placed under ledges of rocks, or beneath the roots of trees hanging over rivers. For the martin delights in broad rivers—they afford him clear space to sail over and furnish the insects he loves. It is entirely contrary to his present habits to fly in woods at all. When he passes a forest, he rises above the tallest trees; nor does he like to frequent boxes in a grove, where the trees are planted too close together. I have known them to desert boxes altogether under such circumstances. When I first put up my present box, the trees in my yard were mere shrubs, the martins crowded to it, and as I stated in my last letter, I counted as many as 104 old ones. But the trees have now grown up and overtop it. The martins have gradually left off coming, until in 1856 not a pair built in it. Upon examination, I found in it a colony of flying squirrels, which, I suspected prevented their building. So I shot some half dozen of these beautiful little animals, caught three, and frightened off the rest. But still the martins would not stay. Every day a few of them would come around the box. The gallant males would sing out to their sweethearts, "*Peep here—peep here*; but none of them would alight to *peep*, whatever they might do on the wing. Upon a close inspection, I

ascertained that two sparrow-hawks were building in the box. I shot them and cleaned it out thoroughly. The flying squirrels and hawks were sufficient cause, doubtless, to frighten the martins away in the first instance. But the coast was now clear; still the martins were not satisfied. Plenty of them would visit the box daily and make the grove ring with their joyous cry. The males would alight and examine all the holes. By the most endearing cajoliries they would strive to induce the females to come in and take possession. Again, and again they seemed to assure them that every thing was right, clean, sweet and safe. "*Peep here—peep here*"—we'll keep you safe as a *custos rotulórum*—as a *custos rotulórum*," these were the words I fancied they uttered; but whether or not I misinterpreted their language, I am sure I express their sentiments. The females wouldn't listen to them. They looked at the entangling boughs of the overtopping trees, which would prevent their sweeps around after insects, and their easy ingress and egress in order to feed their young. Away they went in despite of the persuasions of the males to seek more fitting places to rear their brood. The males sailed after them, rolling out, "*custos rotulórum*," "*we'll keep you*"—"*we'll keep you*"—*as a custos rotulórum.*" I assure you, my dear sir, I missed my joyous and noisy colony very much, and would have spent a very lonesome summer had not the Baltimore and orchard orioles, the red eye and bartrams greenlets, titmill, wrens, robbins, blue-birds, &c., kept my spirits up. A pair of solitary screech-owls took the box as tenants. I let them stay in peace till the next spring, when the martins were expected. I then permitted, with some degree of pain, one of my sons, who is a young Nimrod, to shoot them. He then carefully stopped up all the holes with wisps of straw, which were removed on the arrival of the martins. They acted precisely as they did the year before, and went off to my great displeasure, though I had sacrificed to them the life of one of my finest blue-birds, who had taken a fancy to the box. I am thoroughly convinced it was owing to nothing else than the trees around. So we will in a few days remove the box to a more open situation.

In some respects the martins do us a serious injury. They voraciously prey upon the dragon dry, here called musquito hawk. The dragon fly, I think, will destroy more small gnats and musquitos, in a day than a martin will in a week. I accidently learnt that the dragon fly can be reared to almost any extent by preparing a suitable place to rear their eggs in. I may give you the recipe if you desire it.

To the lover of nature it is a joyous time when the martins come with their cheerful notes; it speaks of stern winter's departure, and announces the genial spring, with its bursting buds and blooming roses. They come on the wings of the tropical winds, laden with fructifying showers. But as none know better than Virginians of a certain age, yours for example, "winter often lingers in the lap of spring." The warm southwest winds, are often stopped in their gentle progress and turned back by rude Boreas. At such times the martins suffer terribly. On the night of the 1st of April, 1850, there was a contest of this kind, ending in a snow storm. I was with my family on a visit to Vermont, in the upper part of this county, I saw many dead martins, picked up by the servants from the sides of the fences and houses. The martins reach here very irregularly as to dates. In 1842 they came on the 29th of March. In 1848, March 12th—1850, April 1st—1851, April 6th—1852, April 15th—1854, March 14th—1855, April 8th—1856, April 10th—1857, April 15th.

So soon as they have paired, rested themselves, and the weather is settled, they build their nests, lay about six white eggs, and generally hatch a second brood of four. They are fond of building at situations on the banks of our rivers, so that they can skim over the wide, low grounds, as well as the river. They bathe frequently, plunging themselves in the water, rising and shaking it off in pearly drops from their feathers. When they drink, they skim along close over the water, holding their wings aloft, and make a succession of dips with their bills, each time swallowing what they have taken up. At the little rills in the forest, they light near the waters, raise both wings over their backs till they nearly touch, walk to its edge, and drink as any other bird. They are fond of lighting on willows; and they pluck many of their leaves to make their nests of.

I do not think the martin has the courage he has reputation for. Though he will chase hawks, crows, and vultures, and pass near them with great velocity, uttering its strong guttural war-cry—*tcha-ate;* yet it will not come in actual contact with them, but will keep at a safe distance, and soon relinquish the pursuit. In this he differs from the tyrant fly-catcher, who will rush upon them, cry—*Hee kill-ye kill-ye!*—light upon their backs, and tear away with its powerful beak, and strike all the time about their heads and eyes with its wings. Nor will they give it up until their smaller size is lost in the distance, whilst their larger adversaries are seen cutting all kinds of gyrations in the air in the effort to disengage themselves from their diminutive but courageous and fierce antagonists. I have never seen any hawk but would instantaneously change its course at the ear-piercing cry of the bee-martin; but they care little for the purple martin. The blue-tail hawk often sweeps down upon them, and picks off one while he is sitting on his box pruning his feathers. Nor did I ever witness, in such cases, any attack by the rest of them upon the hawk, but they would all scamper off as fast as they could.

One of these hawks, that had a nest about half a mile from my house in the wood, would make two or three such sweeps in a day, and very often with success. I was afraid he would break them up, root and branch. I made every effort to shoot the hawk, but in vain. At length he had the audacity to pick up a pigeon feeding in the path in which I was walking, scarcely twenty steps from me. He flew along with it with very great difficulty. By chasing and shouting I made him drop it. The pigeon, though warm, was dead, and as rigid as if he had been killed for two hours. The hawk sat on a tree not far off eyeing me very attentively. I called for my rifle, and so soon as I got it, walked off some forty or fifty yards, leaving the pigeon where he had let it fall. In a short time he came to pick up his quarry. I fired, and laid him dead by the side of the pigeon. I did not weigh them in scales, but from balancing them in my hands, the pigeon, that was very fat, felt the heavier. I tied the hawk to the end of a pole, and stuck him up near the martin box, and for the first time they made an universal attack. But though I observed them closely, I did not perceive that any martin ventured within three feet of the dead hawk.

I have read of instances of the martin's whipping and driving away the blue bird. I have never seen one yet. On the contrary, a pair of blue birds will often keep a dozen martins off from a box, and prevent them from building in it at all.

The young martins of the last brood leave the box from the 1st to the 10th of August. They fly about for a week or so with their parents, who feed them frequently on the wing, and teach them to catch insects for themselves. At night if they can get dead trees or any suitable place to roost on, they will not return to the box,—which is by that time infested with vermin. They spend a good deal of time on the dead trees about the farm in ridding themselves of these pests, and oiling their feathers, as if preparing for their long journey. About the 15th or 20th, they congregate in flocks of fifty or one hundred, and take their departure —sailing in a South, South-west direction. As they progress, many flocks like this join together, and by the time they reach Louisiana, it is said they will extend for a mile and a half in length, and a quarter of a mile in breadth. Occasionally I have seen a few martins pass here in September; these invariably held a due South course. They have great power of flight, and breed all over the United States this side of the Rocky Mountains, and high up in the British Provinces. I have never seen any account that they were to be found West of the Rocky Mountains. And though I have enquired of several returned Californians, I never could make out whether martins were there or not. It is strange that no naturalist seems to know whither they go or whence they come, whose works I have read. Nor does this ignorance appear to be confined to this side of the Atlantic. The Rev. Gilbert White, in his Natural History of Selborne, contended for the hybernation of the Hirundines, or at least of some of them. It was a fashionable theory here once as to many kinds of birds besides the Hirundines. But I believe the idea is pretty generally abandoned now.

Martins can fly at least thirty geographical miles an hour, and feed as they go. This would take them on their journey three hundred and sixty miles a day. If pushed, I suppose they could go double that distance. It is estimated that the wild pigeon can easily travel for a whole day at the rate of sixty miles an hour. Nor has the martin less power of flight when he chooses. He could feed enough on the way to sustain life and strength, and reach Rio Janeiro in twelve days. I suspect that they spend their winters in Brazil. The broad rivers of that country would supply them with an abundance of insects. I had a thought of writing to my friend, our late consul at Rio, Rob. G. Scott, Esq., to know whether he ever saw them there, and at what time. But whilst he is a man of *e-ru-di-ti-on* in law and politics, I do not know whether he has turned any attention to ornithology. I do not mean to insinuate that there is a lawyer in Richmond, or even a child, who walks upon her streets, but that knows a martin when he sees him. But, few men care about birds, and in five minutes after passing a box of martins in full chirp, if asked, "Have you seen a martin to-day?" could not tell for their lives whether they had or not. I do not think Mr. Scott is a man of so little taste, however, and as I do not know his post-office, if he is not a subscriber to the Planter, suppose you send him the number containing this letter, and call his attention to it. Possibly Governor Wise could help us out, unless the squall of the peacock and the scream of the eagle have drowned the feebler note of the martin in his memory.

There is another question which has frequently crossed my mind. Do the martins breed in the country whither they go in our winter? Analogy would say not. For the snow bird, purple finch, golden-crowned wood warbler, tawny thrush, &c., which rear their young in high latitudes and spend their winters with us, do not breed here. But then it is not summer here, and it is summer where I think the martin goes. They reach it in September, its first spring month, and leave about the 1st of Feb., towards the close of its summer. They get to New Orleans about the 10th of February. In that time they could have raised a brood. It would be a strange sight to see birds spending their summers with us without nidification. F.

King William Co., March 4, 1858.

To F. G. Ruffin, Esq.

The Trade in the Horns of Animals.

The trade in animal products of a miscellaneous character is a much larger one than is generally supposed. There are several of the minor products dealt in, which offer an interesting field for inquiry, and for collecting the scattered data which can alone serve to furnish an approximate idea of the aggregate value and importance of the trade considered in a mercantile and a manufacturing point of view.

The horns of animals, for instance, wild and domestic, may seem of a very secondary importance, and yet the trade in them, home and foreign, rises to a very respectable position in the statistical returns. Indeed, the rights and privileges of the horn-workers and horn-pressers have in various reigns occupied the prominent attention of the Legislature. But there is no fear in the present day "of the trade being ruined, and the business lost to the nation," as was the cry when the statutes 6 Edward IV. c. 8, and 7 James I. c. 14 were passed, forbidding the sale of horns to foreigners, and prohibiting the export of unwrought horns. We not only use up our own large home supply of horns, but import on the average fully as many more, namely, about 3,500 tons per annum.

While many of the former uses of horn for glazing purposes, for drinking-cups, for horn-books, and for the sounding instruments of the bold forester, have passed away, other and more elegant and varied applications have been found for this plastic material, insomuch that the trade Directories show us half-a-dozen or more workers in horn, forming separate and distinct classes of the trade.

Large as the present use of horns and hoofs is, we believe that many further manufacturing purposes may be found for them, and that they will become even still more important than they now are in a commercial point of view.

Although the largest trade application of horn is for knife-handles, combs, and umbrella tops, still the other uses are also extensive, and as numerous as the varieties of horn which come into the market, or bristle on the head of the animals characterized by this frontal appendage. Ox, buffalo, and deer horns are those mostly worked up; but the horn of the rhinoceros, ram, and some few other animals, are also employed to a limited extent. For the spiral tube of the antelope, little or no commercial use seems yet to have been found.

The study of the composition, formation, and growth of horn is an interesting one, and well deserving of careful investigation, in view of the manufacturing purposes to which this substance may be applied. In common parlance, any hard body projecting from the head, terminating in a free, unopposed point, and serviceable as a weapon, is called a "horn." But the composition of these differ materially.—Professor Owen well observes, "Even the weapons to which the term 'horn' is properly or technically applied consist of very different substances, and belong to two organic systems, as distinct from each other as both are from the teeth. Thus the horns of deer consist of bone, and are processes of the frontal bone; those of the giraffe are independent bones or 'epiphyses,' covered by hairy skin; those of oxen, sheep, and antelopes are 'apophyses' of the frontal bone, covered by the corium, and by a sheath of true horny material; those of the prong-horned antelope consist at their basis of bony processes, covered by hairy skin, and are covered by horny sheaths in the rest of their extent. They thus combine the character of those of the giraffe and ordinary antelope, together with the expanded and branched form of the antlers of deer. Only the horns of the rhinoceros are composed in longitudinal fibres; so that the horn seems rather to consist of coarse bristles compactly matted together in the form of a more or less elongated subcompressed cone."

The horn of the rhinoceros, like the skin, when polished and in thin layers, is as transparent and mottled as tortoise-shell. These horns are often obtained 2 feet long, and 10 inches in diameter. In India they have the reputation among the Mohammedans of being an antidote to poison; and in older times they were the fashionable scent and oil-bottles of the Roman dames.

It is commonly believed that the horns of the ox acquire an additional ring every year after the third, but the addition of annuli is far from being annual in other species. Many rings are gained in one year's growth of the ram's horns, and in those of the ring-horned antelope. The length of the horn forms a distinguishing characteristic in some breeds of cattle; but whatever improvements may have been effected in the form and character of the carcase, by the modification of food and habits, it does not appear that we have been able to superinduce any improvement or alteration in the size or texture of the horns. Indeed, the horns of the wild animals would seem to be more prominent than in the domesticated races.

The immense horns of the African or Cape buffalo, of the Java buffalo, and the Arnee buffalo of India, are the most valuable, and the extent of the trade in this class of horns may be estimated from the fact that about one million buffalo horns were shipped from the port of Madras last year. As we derive two-thirds of our foreign supply of horns from the East Indies, it is not improbable that the existing disturbances may cause a deficiency in the shipments thence, owing to the interruption of internal communication, and the withdrawal of large masses of the population from their ordinary peaceful occupation of collecting and bringing in the horns to the mercantile houses.

South America (chiefly Brazil and the Argentine Republic) furnishes us with a considerable quantity of ox horns, and we also receive several hundred tons a year from the United States. For buffalo and stag horns we are mainly dependent on India; of the former we import fully 1,400 tons per annum. Averaging these at 1,400 horns to the ton, this would show a mortality of a million buffaloes a year, besides what may be locally used up, or sent to America and the European ports. Of deer horns the Sheffield cutlers and others work up about 400 tons, chiefly derived from Ceylon and the peninsula of India. The "fall" from at least 300,000 head of deer is required to supply this quantity.

Of the aggregate annual quantity of horns entering the market, estimated at 6,400 tons, about one-fifth is manufactured into combs, valued at from £300,000 to £400,000; a large quantity is worked up into knife and cutlass handles; while there are many other miscellaneous uses, in shoe-horns, scoops, drinking-horns, &c. The waste pieces of stag horn are boiled for size in the cloth-making districts; and the pith or slough of other horns and hoofs is crushed for tillage, when light, and thus fit. The heavier portion is converted into prussiate of potash and Prussian blue, of which about 10 tons are made weekly in Sheffield from the waste products.

The hoofs of cattle, being composed of the same material as horn, are used for manufacturing purposes to a small extent; and besides our home supply, we import about £4,000 to £5,000 in value. They are pressed out into combs and horn buttons; but the greater part finds its way to the boilers of the glue maker, and to the manufactory of the chemist, who work them up, with other animal refuse, into prussiates.

As a fertilizer, horn cuttings and shavings are very useful when they can be obtained in any quantity.

The composition of stag horn most resembles bone, while the horns of black contain fully 90 per cent of albuminous matter. It is difficult to estimate what quantity of the horns used up in manufactures, or of the slaughtered animals, are returned to the soil in the shape of manure, in common with the numerous other animal and vegetable products. Mr. Braithwaite Poole, in his Statistics of British Commerce, calculates that the animal manures used yearly, amount to about ninety million tons, besides fat, blood, garbage, &c.—*British Farmer's Magazine.*

From the North Carolina Planter.

Oats and other Exhausters of the Soil.

Messrs. Editors:—The generally received opinion is, that Oats is a greater exhauster of the soil than Wheat. This is a very great mistake. Liebeg, whose authority no intelligent farmer will pretend to call in question, says:

"A greater quantity of the phosphates is removed in the seed and straw of one crop of wheat, than would be removed in three or four crops of barley or oats. The weight of the ashes of a crop of the seed of wheat, is to that of oats, as 34: 466; the phosphates contained in them as 26: 10."

I know there are persons who will say—"I don't believe a word of it; for I have always heard that oats are great exhausters of land; certainly much more so than wheat." One of the reasons assigned for this opinion, is the rapid growth of oats—their maturing in much shorter time than wheat. By the same sort of logic or arithmetic I suppose these skeptics can make it appear, that if one man eats a loaf of bread in one hour, he eats less than another man who eats a smaller loaf in half an hour.

Science has exposed and removed many such fallacies that have been handed down to us, founded only in ignorance and a blind credulity—a sort of superstitious belief in the simple "*say so*" of those who have gone before us. And the only way to remove this sort of credulity and superstition, and to set us to thinking for ourselves, or to acquire the power to resist their effects, is to obtain a knowledge of true scientific principles, and this knowledge cannot be obtained without reading and study. Yet we have planters among us—intelligent men too—who ridicule the very idea of *book-farming* as some are pleased to call it. Yes, even deprecate reading anything on the subject of agriculture. Some are disposed to ridicule agricultural societies, and every thing and every body connected with them. I hope the days of all such old fogyism will soon be numbered in North Carolina.

Super Phosphate.

From the Southern Farmer.

Seed Oats.

Mr. Editor: While rummaging among some old books and papers the other day, in the attic, I accidentally stumbled upon some pamphlets published in 1791, from which I extract the following mode of preparing seed oats. Thinking that you might possibly find a corner for it in your paper, and that some of your readers might try the experiment the present year, and communicate the result through the columns of the Telegraph, and thus lend a helping hand to the promotion of agriculture I send it. FRANK.

Twenty-Third Ward, Jan. 20, 1858.

Philadelphia, Aug. 17, 1790.

Sir; Permit me, through you to lay before the agricultural society, the result of the following little experiment: Late in

the month of April last, having a piece of ground in the vicinity of Lancaster, prepared to be sown with oats, which I supposed would take sixteen bushels of seed, the evening before it was sown, I had eight bushels put into a trough and covered with water. The next morning, the water was drawn off, and the oats laid in a heap to drain for a short time; then plaster of Paris, in powder, was mixed with them till they acquired a sufficient degree of dryness to be sown evenly. In this process, one bushel of the plaster was consumed; the seed thus prepared, and dry seed from the same original heap, were sown on alternate lands throughout the field. The whole came up together, in due time, and no difference was visible for seven or eight days. From that time forward, the distinction became very evident. The oats on the lands sown with prepared seed, were much more luxuriant and of a deeper green, until they began to ripen. On the 2d instant they were cut, being then perfectly ripe; while those on the lands sown with unprepared seed, were yet green, the heads much smaller, and promising in every respect a worse crop. On the 8th, I left home. They were then unfit to cut, and appeared as if they would not be fit to cut for five or six days after.

Lancaster, March 4th, 1791.

Sir: In August last, I communicated to the agricultural society the result of an experiment I made the preceding April, by preparing seed oats with plaster of Paris, so far as it could be ascertained.—Having since determined the difference of the produce from the prepared and unprepared seeds, I beg leave to lay it before the society. The produce of the eight bushels of prepared seed, was one hundred and twenty-bushels, and about a peck; of the like quantity of unprepared seed, ninety-six bushels; the former yielding an increase of fifteen and a quarter for one, or thirty and a half bushels to the acre; the latter only twelve for one, or twenty-four bushels to the acre. The produce of the prepared seed weighed thirty-three and a half pounds the bushel; that of the unprepared only thirty-two and a quarter pounds. So for about five shillings, the expense of a bushel of plaster of Paris, I gained twenty-six bushels of oats; and by allowing for increased weight, one and a quarter pounds per bushel, on one hundred and twenty-two bushels I may fairly add four and a half bushels more, making, in the whole, thirty and a half bushels.—*Ger. Tel.*

Cultivation of Peanuts.

The extraordinary number of peanuts that have been brought to our market this fall, induced us to make some enquiry concerning the cultivation, and the uses to which they are applied. We learn that the culture has extended very much within a few years in the lower counties—Sussex, Surry, Southampton, and generally those trading with Norfolk. The crop is one very easily grown, yielding a large product, and commanding good prices.—The price this season has been lower than for several years past, ranging from sixty to eighty cents per bushel, according to quality; but even at that price, there is perhaps no other crop yielding so much net profit. The soil best adapted to the ground pea is a moderately rich loam, neither very heavy nor very light. A stiff soil will not admit the stems bearing the fruit to penetrate it with facility, and a sandy soil is too thirsty. Again, if the soil is too rich, the tendency of the plant is to run to vine instead of the formation of fruit. Any soil of the requisite texture, capable of producing five or six barrels of corn to the acre, is well adapted to the growth of the ground pea without the addition of any manure. But should manure be used at all, it should be in small quantities.

The ground is prepared by laying it off in rows three feet distant, and very slightly ridging, as in the culture of cotton. When manure is applied, it should, as in the case of cotton, be put in the drill. Throughout the entire cultivation, the chief objects should be to keep the ground clean of grass, and as level as possible. The slight ridge on which the seed are planted will be nearly or quite worked down by the first hoeing. As the vines extend over the surface, it is necessary to keep the ground well stirred with a trowel hoe, or other implement that does not turn it over. A couple of plowings, and an occasional working with the hoe, is regarded as a sufficient amount of cultivation—less

than what is required for cotton, and not exceeding that of the corn crop.

As soon as the vines are killed by frost the harvesting should commence. The first operation is to run a coulter close to the vines, on each side, for the purpose of loosening the earth. The plants are then taken up with a hoe, and laid bottom upwards on the ground to dry. There they are to remain for several days, until they are cured—the time being shorter or longer according to the state of the weather. If it rains, it will do the crop no injury. When sufficiently cured, the vines should be packed away in a barn, or under any good shelter, where the fruit may be picked at leisure.

A fair crop may be regarded as about 75 bushels per acre, and is frequently as much as a hundred. Some of the farmers in the lower counties raise as much as five hundred or a thousand bushels. The crop has, to some extent, taken the place of cotton, requiring much less manure, and being more profitable.

A great advantage attending the cultivation consists in the value of the peas remaining in the ground after the crop is gathered. The hogs are turned on the field, where they thrive rapidly. So rich is the nut in nutritious matter that many farmers think the portion remaining in the ground after digging, is equal in value, as food for hogs, to the entire crop of corn the land would have produced.

The ground pea, we understand, is used for several economical purposes. It makes a valuable oil, and forms a constituent of the ground coffee that is extensively sold in some markets. Such being the case, the demand will doubtless increase in proportion to the increased production.

So. Farmer.

Corn Planting.

Does the earliest planting always give the best crop? No. Planting at the right time gives the best result. And when is the right time? It is important to know, for when that time comes, not a moment is to be lost. Corn is a tropical plant; it loves a great deal of heat and but a moderate degree of moisture: it will flourish only in tropical countries, or those which have the summer of tropical climates. Under favorable circumstances, it grows rapidly. Three months will carry it from germination beyond the danger of injury by frost, provided the weather be warm and not over wet. Without these favoring circumstances, it "gets contrary," so to speak, and won't grow. These are essential to its tropical nature. There is hardly a more important problem for the corn-grower, than to hit upon the time for planting, when the seed will come in three or four days, and then grow "right on" without stopping.

Wheat, rye, oats, almost anything else, will wait for growing weather, without injury to the final result Not so with corn. The farmer must give it the three hottest months in our climate, so nearly as his judgment will enable him.

The true advice with regard to this crop is, not to plant early; but as soon as the ground is warm and there is a reasonable hope of its continuing so, not to lose a moment.—*Plough, Loom and Anvil.*

From the North Carolina Farmer.

Sugar Cane Culture.

The following letter on the "planting, culture and manufacture of the syrup from the Chinese Sugar Cane," has been handed us by the Secretary of the Richmond Agricultural Society, and we take pleasure in laying it before our readers. It will be found to possess much valuable information, to those desiring to enter into the culture of this important product.

From the adaptedness of the Chinese Sugar Cane to our soil and climate, and the facility with which the syrup is produced, its culture will doubtless soon form an important part of the Agricultural industry of the Southern States. Every one will, therefore, be desirous of seeing the experience of those who have tried and proved it.

From the Argus.

ROCKINGHAM, Dec. 11th, 1857.

Dr. A. Patterson, Cor. Sec'y.

Your letter as corresponding secretary of the Richmond Agricultural Society, has just been received, and I hasten as you request an early response.

You are pleased to ask, for the benefit of your Society, for such information as I may possess in relation to the planting, culture, and manufacture of Syrup from the Chinese Sugar Cane.

The seed I planted the present year, were the product of some few obtained from the patent office the year before.

The ground, (gray sandy soil) had been respectably manured for a series of years, and at the time of planting would have yielded some 25 bushels of corn to the acre.

I broke up the ground in the usual way, with a one horse plough, after which, when I got ready to plant (early in April) I took the common shovel or scooter plough, and fixed a wooden mould board, by simply nailing upon the helves on the side just above the plough two pieces of weather-boarding plank, some 12 inches long.

Being thus prepared, I placed one of my briskest working horses to the plough and run off my rows three feet apart, going twice in the same furrow.

I did this in the first place to deposit my manure as deep as possible, so as to avoid any waste from evaporation, and in the second place to protect the young and tender plant from the cauterizing effect of too near proximity to the Guano.

I then took 200 pounds of peruvian Guano to the acre, and after mixing it with vegetable mould, I drilled it in the bottom of the furrow, just as you would cotton seed or other manure.

This being done, I took a one horse turning plough and lapped on either side one furrow and let the ground remain until it become compact.

When ready for planting, I opened with a small Drill plough, after the manner of planting cotton, and at the distance of three feet in the drill I dropped from five to eight seed, covering them not more than one inch deep.

I worked it, just as I worked my corn, with this difference, that it took one ploughing less.

I left the ratoons or suckers, to remain after thinning out to two stalks in each hill.

In September Court week (about the 20th,) I cut it off within some 4 inches of the ground and took it to an iron mill, of two rollers, which had been purchased in Georgia, by myself and relations, for the express purpose of manufacturing the syrup.

The fodder was stripped off before the cutting.

It was then run thro' the mill and the juice expressed by the aid of one horse attached to a lever.

I planted one and a half acres, and had my kettle of capacity sufficient to boil the juice about as fast as it was expressed.

In the boiling process, I had the experience of those who had gone before me.

I boiled the juice about 6 hours regularly, skimming off the scum and froth as it arose to the surface.

The juice yielded, about 1 to 7.

I made 270 gallons of a very superior article, equal, in my estimation, to the best New Orleans.

I give it as my opinion, of which I have no doubt, that from land yielding 50 bushels of corn to the acre, that 200 gallons can be made.

I look upon it as forming an era in the agriculture of the country, and one of the greatest blessings vouchsafed to man (Indian corn excepted.)

It came at a time when molasses had rose high and got beyond the reach of the masses, when the consumption had overreached the production.

It is now in the power of every family to have a cheap and wholesome food to their command.

One of its main values, is a food for hogs; for this purpose I refer your society to the last number of the Southern Cultivator, in which you will find a fair experiment made by a planter and the result given to his brother farmers, over his own signature.

He took two shoats, the one weighing 76 the other 78, and placed them in two separate pens.

To one he fed corn and slops from the kitchen, to number 2 he fed only the unground chinese cane with its seed.

At the expiration of 3 weeks, he weighed both.

No. 1 gained 39 pounds, and No. 2 gained 37 pounds.

This statement I verily believe, for from the great abundance of the sacharine matter, it must be highly nutricious.

If this be so, I ask what more do the Farmers' require?

All my fears are that the seed will deteriorate by running into other varieties. Against this we should guard.

Whether it will make sugar or not, in sufficient quantities to justify its use for

that purpose, I have no means of ascertaining.

The "Sorgho Sucre," the seed of which has been distributed by the patent office for the last three years, is of chinese origin, and of a dark purplish color.

I look upon the seed for food about as valuable as oats, weighing some 38 pounds.

It is wonderfully productive in seed. I made 70 bushels on the ground spoken of.

I have sent the iron mill to my Anson plantation, where I expect to plant the coming year 15 to 20 acres solely for my black family and stock.

Should you go into the manufacture of the syrup, I would advise you to procure the sugar kettle proper, which is not circular but oblong.

This enables you by exposing a greater amount of surface to evaporate, to complete the boiling process, in a less time.

I used a small quantity of lime in each kettle of juice, to correct and neutralize the acidity, say about one gill to forty gallons.

We have up this way the greatest plenty of seed, and it would afford me pleasure to furnish my Brother Farmers of your society gratuitously, with some 3 or 4 bushels should you require.

I write you in haste, as I am about leaving home, and this letter is at your disposal. Respectfully, sir, yours truly,

W. F. LEAK.

Gout in Fowls, &c.

Editors Southern Cultivator.—Every planter should contribute his mite, (not the genius *Acarus*,) but the mite the widow threw in, which was commended as of more value than the oblations of the rich; and sustain the *Southern Cultivator* with his practical, not theoretic mind.

I observe in one of your numbers, a correspondent is inquisitive to know a remedy for that formidable and ofttimes fatal disease, the gout in fowls. A valuable gamecock afforded one of my little sons an admirable subject for experiment.

He made a salve of *tar*, *soap* and *sugar*, incised the protuberance, or tumor, crosswise, and bound the foot tightly by passing the bandage round each toe. In a few days it was removed, and a dark, hard mucus, of a fætid odor was extracted; and one would not imagine how such an obdurate tumor could occupy so limited a space just at the junction of the toes with the shank, or tibia, I believe the books call it.

Turner's Cerate was applied after a bath of soap and water, and now, the gouty game is assuming a bright, new plumage, as he had been nearly plucked and bereft of that chanticleer glory, and feeding freely on chopped peppers and homony, and I believe, if sulphur was added, it will be more efficacious still, to effect a perfect cure.

We have also suffered heavy losses of poultry; no age, or kind, being exempt. They eject from their mouths, by a sudden jerk, an acetous fluid, fall back and expire: others sit in profound repose until they extend their wings, turn over and die.

We have found cayenne, mixed with grist or homony, and bleeding under both wings an excellent remedy; and I have been recommended to secure a small bag of Asafœtida in the poultry yard trough, with an ample supply of fresh water, as a preventive, it being a highly fœtid gum, stimulant and antispasmodic; it is worth a trial, when this vindictive enemy invades our extensive poultry-yard enclosed by a tabby wall and tabby floor, to keep out the rats, and correct a bad atmosphere.

The oat patch you recommended, is an admirable auxiliary, where some 90 or 100 young turkies luxuriate every fine day, with their coops arranged under the grapery in a cool shade.—*Southern Cultivator.*

From G. W. Bond & Co.'s Boston Circular.

The Wool Trade.

We have taken great pains to ascertain the stock of domestic fleece wool remaining in the country, unmanufactured, on 1st January, and embrace this opportunity of thanking the many friends who have aided us in this undertaking.

Taking the extreme estimate furnished us, we make:

In the principal markets of sale, say	5,000,000 lbs.
Scattered about the country in the hands of dealers, speculators and growers,	5,000,000 "
In the hands of manufacturers,	9,000,000 "
Total, say	19,000,000 "

If this is near the truth, and we cannot find reasonable grounds to doubt it, the clip of the country must be short of what it has been usually estimated.

Imports.—The imports of last year show an excess of nearly 10,000,000 lbs over that of the previous year, while the stock on hand is increased but 5,000,000 lbs. This is in part accounted for by the unusually small stock with which we commenced the year, and by the reexportation of about 3,000,000 lbs. The stock in New York, at the close of the year, was about the same as here, say 6,000,000 lbs.

Of the 12,000,000 lbs in New York and Boston, of foreign wool, we suppose that about only 8,000,000 lbs are adapted only for carpets and negro cloths, and 4,500,000 for clothing purposes. A part of these last, in the low depressed state of the market, may also be used for carpets.

These wools have been purchased at extremely high prices in the markets of production; it is generally believed by those most familiar with these markets, that it will not be easy, soon, to purchase at such rates as will be safe to buy at, which, with the general reluctance to enter upon new transactions, will probably prevent any considerable imports for at least the first half of the present year.

A table of imports of wool into England, for a series of years, shows how inconsiderable is our whole trade compared with theirs, and while it exhibits a large aggregate increase for the past year, shows a decline in the import of fine wools.

The high prices and low stocks of wool all over the world, accompanied as it is, with an accumulation and low prices of manufactured woolens, is considered in England as well as here to indicate that until the recent check, the machinery in operation was in advance both of the supply of the former, and of the demand of the latter.

We show in this country very little of this excess, and if, by the aid of the new tariff, we can have wool as low here as in Europe, we look forward to a period of prosperity for our manufacturers. American wool in England—our fine fleeces—brought during the panic, at the late London sale, from 40 to 46c. cash; our wool growers will no longer fear that they will be sufferers by the change.

It is proper to remark that in the imports and stock on hand of foreign wool, there is a much larger proportion than formerly of that in the unwashed state.

Comparative statements of the imports of wool at Boston and New York:

	Boston		New York.	
	1855.	1856.	1855.	1857.
Total,	7,245,996	8,425,807	17,941,081	10,183,452

Stock of foreign wool on hand at Boston, January 1st:

1855	17,364 bales and	7,200,000	pounds.
1856	8,503 do.	3,400,000	do
1857	2,301 do.	1,140,000	do
1858	15,723 do.	6,066,000	do

Poultry—In-and-in-Breeding—Guinea Hens.

In the last volume of the *Agriculturist*, page 248, we gave our opinion of Guinea Hens and Peacocks, which was not very strongly in favor of these "ugly, vain, vicious, pugnacious, noisy, rude, cowardly, birds, which we still keep, however, for the "variety which they give to the poultry yard, and the luxurious plumage which decorates them." A correspondent of an English journal, The Field and Country Gentleman's Newspaper, comes to their rescue in an article that we copy more especially for the sensible suggestions he gives on the subject of breeding, which are applicable to all kinds of poultry, as well as other animals. The writer says:

How rarely do we see any encouragement given to Guinea fowls at our poultry shows. The reason I am at a loss to determine, as they are a really useful sort of poultry, and number several varieties. If not bred too closely, the chicks are as hardy as most fowls; they are very abundant layers, and their eggs and flesh are much esteemed; they cost very little to keep, at least in the country, where they do good service by devouring an immense amount of insects, which would destroy far more produce than they themselves possibly could. I do not consider them adapted to confined poultry yards; but I think no one who has convenience for them in the country should be without them. I am aware that they are usually thought too delicate to rear, and such is certainly too often the case; nor can it be wondered at, if we consider how they are propagated. For instance, a person procures a setting of eggs, and hatches them

under a common hen ; a brother and sister are reserved for stock ; these breed ; an accident happens to one parent, and the other breeds again the next season with its own offspring. A neighbour obtains a setting of eggs from these, and the produce goes through a similar course of in-and-in-breeding ; and then the birds are at last discarded as so very delicate !— The wonder, however, is, that any are left at all to breed from. My plan, when I commenced, was to procure a cock and hen from widely different parts so as to avoid any relationship. From these I bred, saving four pullets, and again purchased two of the finest cocks I could procure from a different place. For the years I had that stock the chickens were much hardier than the common fowls. I pursued the same practice with turkeys, and exceeded far beyond my expectations; this plan of breeding I have adopted with all kinds of poultry, and I can confidently recommend it to others.

The common color of Guinea fowls is a dark grey, the feathers having small round white spots on them. The varieties are pure white and ash colored, that is to say, a pale, soft bluish grey, the feathers marked with white spots. Black are also to be obtained, but are not very common ; those having a deep black ground and clear white spots are the most difficult to obtain, and I think by far the handsomest.

The Crested Guinea fowl is, I believe, a different species. It is rather smaller, of a grey plumage, the white spots not quite so distinct, the pinion feathers being reddish brown ; and, in place of the horny casque, it has a plume of feathers on the head.

Lameness in Horses.

BY W. PIERCE V. S., RAVENNA, OHIO.

Why are so many horses lame ? This question every practitioner is frequently asked. Lameness is becoming so common that we can scarcely find a horse that is not either lame, or if he is not so, it is because both feet, or limbs, are alike stiff and sore. As we pass along the side walk, it is seldom we see a horse stand with his limbs and feet in a natural position, but generally find some with one forefoot set out as far as it can be reached, others with both feet thrown forward ; some with contracted hoofs, others with evident fever· feet; some standing tiptoe with the knees bent forward, others sprawling like a bear, on their pasterns ; some with contracted or sunken breast, others shoulders, and many with cracked hoofs, ridged surfaces, and contracted heels.— And indeed it is rare to see a perfect foot on a horse (in Northern Ohio) after he is four years old. The reason given for this, I hope, will put some on their guard, and set others thinking. In the first place the colt is taken in hand to break. The owner, although not a judge of colts, thinks he will make rather a fancy horse. He commences by taking him to the smithy. He tells the blacksmith that he wants the colt shod forward, and to do it in the most scientific style, make his foot look fancy, cut the heel down so as to have a wide-heeled shoe, cut away the frog, dress out the bottom of the foot, and "do it up brown," as the colts should be shod "scientifically" the first time ; sock the nails home, clinch fast, don't be afraid of your rasp. "Now he looks as if he could travel, and if there is any trot in him it must come out."

Now, boys, we have done harvesting, and the colt is shod, and we will have a week to visit and break colts in ; we must not go far the first day ; five miles is far enough when they're all in a sweat, with the new shoes on, feet highly fevered, and painful. The colt must show out a little, go to town and back, five miles more, then go home, perhaps checked up all this time. Now where must all this fever terminate ? In the feet, most certainly, and when turned out, the uncomfortable condition and pain in the feet will cause him soon to lie down. On feeling the feet, they will be found intensely hot, and the pastern arteries beat with great violence. The feet, now confined with an iron bar spiked on with eight strong nails, minus the most of the frog and all the insensible sole, is not only confined but deprived of its usual moisture. But it won't do to let this colt remain idle too long ; he will forget what he has learned. Use him often, but be careful of him. When he trots, put him through, don't teach him to mudge along, but be careful. Let him know he can get up his head and handle his feet ; but be careful, colts are esily hurt. But don't let every one drive past you ; let them

know we have as good a horse as theirs, but be careful. It is a poor Morgan that can't go his twelve miles an hour on a good dry, hard road, or planks; and one hour's drive can't hurt a colt much, if he is well shod. How it looks to see a fine carriage, plated harness and whip, moping on a good road in the hot sun and dust?—Get right along as though you were men of business, and had some life and energy about you! But be careful of the colts. If they should lose any shoes off, give particular directions to the smith to put them on very nice.

Yes, this nice, stylish, scientific shoeing, which is ordered by every one who has a horse, is doing more mischief and harm to horses' feet than it could do to let them run barefoot all their lives. It renders them less serviceable, causes more pain, and leads to more grievous evils than any other course. It is the cause of the greatest barbarities, by frequent change of masters. Who is afraid to purchase a horse, that never was shod? Some may ask, Who ever saw an old horse, that never was shod, but I have seen horses over twenty years old, that never had shoes on their feet, and yet were almost constantly in use. In the early settlement of Western Pennsylvania, it was rare to see a horse shod; and it is only of late that shoeing the hind feet has been practiced. Although the country is mountainous and stony, it is not uncommon to find horses, four, five, or six years old, that were never shod. Bad feet, and lameness from shoeing, are seldom known. The shoers there would be called bunglers. They seldom take much pains, pare but little, bang on the shoe, and let it go. If it stays on only one week, so much the better; it may be two or three months before the horse will be needed again. It is my practice to tell the shoer (if he asks anything about how I will have it done) to do it in the most bungling manner he knows how; I only forbid fancy shoeing. I always dictate the shoeing of diseased feet while treating them. A fevered foot is apt to remain so as long as the horse lives: I never knew one to recover without treatment. I think nine cases out of ten of all this lameness, contracted tendons, nerves, and sweenied shoulders, have their cause *in the feet*, either from *fever*, contraction, ossification of the cartilage, indentation of the margin of the coffin-bone, or a grub which we lately discovered working between the sensible and insensible sole of the foot. Its track can be easily followed, by the dust formed in its passage around the lower part of the hoof, and as far up as the coffiin-bone. This lameness can be cured by treatment to kill the grub, or the application of turpentine. In some cases, it would be difficult to find the grub without injuring the foot; and the latter remedy will be effectual, if one exists in the foot. The causes to which diseases in the feet can be traced, according to my observations, are as follows: Fancy shoeing, 60 in 100; founder, 20 in 100; congestive fever, 5 in 100; driving into cold water, sudden chilling, &c., 5 in 100; hereditary or unaccountable, careless shoeing, 5 in 100. There may still be other causes; but they are so rare, that a practitioner may not meet with more than one of each in a lifetime. Wounds, strains, and fractures of bones sometimes occur in those parts; but the skilful practitoner will readily detect these. This matter is worthy the investigation of all lovers of good horses. —*Ohio Farmer.*

Harvester and Stacker.

This ingenious machine the editor of the *Ohio Farmer* has seen in operation, and says it answers the purpose well. Its proprietors are Murray, Van Doren & Glover, Ottawa, Illinois. We give below what they say of it:

"This machine drawn by four horses, is warranted, in the hands of ordinary, careful men, to cut seven feet wide, and discharge the grain into a molding box, where one man forms the stack, with the heads inside and the butts outside, binds the same with two wires, and then dumps it as a cart-load of earth is dumped, setting the stack firmly on its base, perfectly thatched and "shingled," to defy any harvest storm.

"*Shocks.*—The shocks or stacks are 4 by 4 feet on the ground, and 6 feet high. From four to six of them make an acre of ordinary grain. Their style and appearance is symmetrical, and gives evidence of perfect power to resist storms.

"*Binding.*—This is done with fine wire, which costs only about twelve to twenty cents per acre, and will last many seasons.

"*Straw.*—The length of straw can be cut to suit. Where it is of little value, it can be cut short; it may then require three bands or wire to the shock, but there will be fewer stacks to the acre, and the threshing can be done half a cent cheaper per bushel than where longer.

"*Curing.*—The past season has been very wet, yet grain cut in the milk and dough by this machine has cured perfectly in every instance. There are no thick bands to rot under, and if there were, no wet could get there. Of 140 acres cut by this machine, (the only one yet built,) not a single shock took damage, or had to be opened to dry. How many can say the same of 140 acres?

"*Bleaching.*—There is no bleaching to the grain put up by this machine. The heads of every course except the top being all under cover of the butts of the preceding course, there is no chance for bleaching.

"*Raking.*—This is done by the simplest contrivance—Glover's Rakers. They are but a few sticks of wood, and can be made with a jack-knife and hand-saw.

"*Sickle.*—The sickle is the ordinary scollop, but has a remarkably large stroke and quiet motion; such that the slowest oxen will cut the grain perfectly, and yet the fastest walk of horses will not jar or rattle the machinery.

"*Solidity.*—The solidity of these machines is unequalled. It is as substantial as an ox-cart, and scarcely more complicated.

"*Centre Draught.*—Its centre draught is perfect, owing to the weight of the shocking cart being on the side of the wheel opposite the cutter bar.

"*Uneven Ground.*—The ground wheel is hollow, *having neither spoke nor hub.*—This brings the bearing close to the ground, and by a peculiar, but natural and simple shifting of the centre, where the ground is uneveu, all unsteadiness is done away with, even when running along the side of, or across a dead furrow. It never tips or falters.

"*Hauling.*—The simplest and best way of doing this is by a light stone boat, either running on the ground, or mounted on wheels. Half an acre can be so hauled at a load by a span of horses.—*Country Gentleman.*

From the Prairie Farmer.

Letter from Japhet—Properties of Arsenic explained—Its Effects on Hogs.

EDITOR PRAIRIE FARMER:

I have noticed, with considerable interest, the discussion in your pages concerning the merits of *arsenic*, for the cure of the kidney worm and other diseases of swine. Not one of your correspondents appears clearly to understand the real nature and power of the article used. They talk of giving it as they would salt, sulphur, saltpetre, or any common and comparatively harmless remedy. *Arsenic is one of the most powerful mineral poisons known.* The common dose, in medicinal preparations for human patients, is only the tenth of one grain. Sometimes, in extraordinary cases, the half of one grain is given; but it is considered dangerous practice. From three to five grains, according to the habit of the body and vigor of the constitution, would be pretty sure to kill the person to whom it was administered.

Now, swine are known to possess an organization that will withstand, to a great extent, the destructive power of nearly all poisons, especially when in fine condition. If not struck near some nervous or vital centre, such as upon the nose, or under the shoulder, they suffer very little from the pangs of the most venomous rattlesnakes; and when administered in, and thoroughly mixed with, large quantities of food, a grown hog will sometimes show no bad effects from a dose of a full ounce of arsenic. Dr. Hall, of Alton, relates seeing a breeding sow of his struck by a large rattlesnake repeatedly on the side, and she showed no bad effects from it. In another case, a rattlesnake, supposed to be dead, was thrown into a yard to a breeding sow. Upon her seizing the reptile, it rallied and struck her on the end of the nose, and she died in less than an hour. Ex-Governor Aug. C. French reports giving (by mistake) to a large, favorite, aged breeding sow, a full ounce of arsenic, mixed in a pail of dough. The sow showed symptoms of kidney worms, for which the dose was administered. It cured her, but at the same time she "got shed" of her old coat of hair, and the outer coat of her skin, and in place of them got new hair and a new epidermis.

Arsenic has a peculiar influence on the skin—rendering that of the human patient transparent and rosy, and the coats of animals glossy and soft. For this reason, it is said to be eaten by the fashionable ladies of some European cities, and there are whole nations who practice arsenic eating. Arsenic is an ever present ingredient in the "doses" compounded by professional horse jockies, whose business it is to manufacture "2:40" nags out of broken down hacks and used up horses generally. It is not necessary to say that the condition of the regular arsenic eater is like that of the man who has a tiger by the tail—"it is dangerous to hold on, but is death to let go."

The rationale of the action of arsenic in destroying the kidney worm may be stated, I suppose, as follows: The kidney worm is a parasite, a creature of very low organization. Its presence produces inflammation of the parts where it ss lodged, and brings an unusual flow of blood there. Arsenic is mixed with the food, and from the stomach taken into the circulation, and an undue share goes to the seat of the disease, because more blood is carried there. The poison becomes a part of the food of the worm; it has little life at any rate, and that little the poison extinguishes. The cause gone, the inflammation subsides, the foreign matter is sacked so as to be harmless, or absorbed, and the animal recovers. I believe ten grains of arsenic, administered twice a day every other day for ten days, thoroughly mixed in half a a pailful of indian meal dough, would be a sufficient dose for a full grown animal—younger, in proportion. JAPHET.

Fair Flop Farm, Ill., Jan. 15, 1858.

A New Method of Hop Growing.

The expense of furnishing poles for a hop yard is a formidable obstacle to the cultivation of this crop. The cost is not far from two hundred dollars per acre, a sum so large as to deter many small farmers from entering upon the business. The poles, too, being exposed to the weather, decay rapidly, and have to be renewed after a few years.

To economise in this outlay, the hop-growers in some parts of the country are turning their attention to wire and cord as a substitute for poles. They lay off the plantation in the form of a paralelogram, or square. On the east and west sides they put up a row of substantial poles, eight or ten inches through at the butt, at a distance of seven feet from each other. These poles are about the size of these used for telegraphs, and are about fifteen feet high. Between the outside poles are east and west rows of smaller poles, at distances of forty-nine feet from each other, for the purpose of holding up the suspended wires. The rows of small poles stand seven feet apart. A wire is now run from the east to the west side of the field, on the top of these small poles. The wire is about the size of that commonly used for the telegraph. This gives forty-nine feet of wire between each two small poles, making room for seven hills of hops. From this wire a small cord is suspendid about five feet, sufficiently strong to hold the hops, and to last several years. From the end of this cord a still smaller one runs down to the ground, and is there fastened. Around this the hop vine is trained, and it is said to adhere with as much tenacity as to a pole. In the fall, when the hops are ready for harvest, the small cord is cut, and the hops are picked in the usual manner.

The following advantages are claimed for this method: There is a great saving of expense in the poles. One large pole does the work of seven. A great deal of labor is saved in handling poles at the time of harvest, and in storing them for winter. The taking up of the poles at the time of picking, and the replacing them again in the spring, forms a large item in the expense of hop growing. By the new method, a string is cut, and the hill of hops is ready for growing in the spring. The wire is much more permanent than the poles, and the expense is much less. The cost of cord for the vines is trifling.

Those who have tried the new method are muched pleased with the results, but it is not generally introduced. Those who have poles upon their hands for eight or ten acres of hops, will only introduce it as their stock of poles is reduced by decay.

[*Amer. Agriculturist.*

WORTH KNOWING.—Mr. Benjamin Treat, of Southville, Connecticut, has lost several cattle lately. They were poisoned by licking the paint of a newly painted barn.

From the Massachusetts Ploughman.

Machinery to aid Farmers.

Various efforts are made to reduce to system all farm work, and to trust to machines to accomplish the heaviest part of the business. Cutting the grass is considered the hardest part of the labour, and various machines of modern invention would throw this labour on horses or oxen, "and spare mankind."

We, of the Ploughman, have not been a quiet looker-on, for we would try all things, and hold fast that which is good. We have had two machines of different power on our own plain fields, (twenty-five acres in one lot,) with as smooth a bottom as any prairie of the West. At first we thought we could say a word in favour of the economy of using them on large plains, and we called together a large number of farmers to witness the progress of the red-top grass with one ton to the acre.

But we were constrained to say that we were disappointed on this first trial, and could not honestly say that we could gain anything by using this new scythe. We soon had another mower sent to us, and an agent came with it from Philadelphia. He had the use of our team, oxen and horse, and it required both to drag it. This was a total failure, and the agent in attendance acknowledged it. All was fair; he charged us nothing for the use of the machine, and we charged nothing for team and keeping. Luckily we did not at this time call together our neighbours and kinfolks to witness our disappointment, and we were spared the mortification of a failure in the presence of a multitude.

Neither of these machines was claimed as Manny's, or Allen's, and we took no pains to inquire who made them, and not caring to say much to dishearten those who appeared in the cause of lightening the labours of haymakers. We have had quite favourable accounts of Manny's machine and of Allen's—but a want of faith in the use of any mowing machine of the above kinds, and of Ketchum's, has enabled us, thus far, to rely on hand scythes and hand-labour to cut all our grass on smooth plains and on rough meadows.

We are aware that our views differ from numbers of good farmers who imagine that they save much by horse power in cutting grass. They have been more fortunate than we have, and they have faith which we can hardly hope to equal. Still, we are ready to publish all their facts and arguments, reserving a right to reply.

Much indulgence is due to all who make efforts to lessen the labours of farmers. And failures of new implements must be expected. Let us have all the arguments and facts in favour of new contrivances to save the sweat of the brow, and then judge fairly of the advantages.

We prophecy that such heavy machines as have been exhibited here will not answer the purpose of mowing. We must have something lighter, or continue to use our own scythes and snathes which weigh less than fifty pounds when fastened together.

But we see by the reports of the great meeting at Rochester, N. Y., that not less than three of the mowers there offered for premium weighed nine hundred pounds each. It is our private opinion that the dragging of such machines across our grass plains will cause more loss of horse flesh and ox flesh than all the saving that is made in the sweat of men mowers.

The question is yet new, and farmers must judge for themselves. They are not to take the statements of interested inventors, or of those farmers who have a copy gratis and feel under peculiar obligation on this account. We must always make some grains of allowance in judging for new machines.

One good farmer tells the public that he thinks he saves *one-half* the cost of getting his hay by having a machine. Now, let serious farmers consider that the cost of cutting the grass is never more than *one-third* part of the labour of getting the hay. How, then, can the mere cutting save half the labour of haying? Should the machine operate alone without horse or water power, without attending, without grinding, and without artificers to keep it in tune, the saving could be only one-third part of the cost of securing the hay harvest. Let us therefore examine closely all statements of enthusiastic admirers of new modes of farming. We are bound to do this in self-defence—

for we would not lag behind in any change to lessen the labours of farmers.

Reapers for grain harvests stand on a footing differing much from mowers. Grain should never be cut close to the ground, and machines that do the cutting four or five inches high go more safe than cutters close to the surface. And fields of grain suffer more by delay in cutting than grass does. Grain cradles and grain machines are useful in large fields, for much is wasted by delay.

Winter grain comes forward quite uniformly, and we begin to cut by the middle of July—spring grain two weeks later. Both must be cut at a certain time or waste follows. A machine for cutting grain, therefore, is like a horse-rake for hay. There is a certain time in the afternoon (a few hours) when hay must be raked or be partially injured by the dews. It is very important that this work is performed in a rapid manner. Thousands of tons are saved from dews and showers by means of the horse-rake.

This is not the case with the operation of cutting grass. It may be cut in the evening or in early morn as well as in mid-day, notwithstanding the direction given in newspapers to wait till all the dew is off before we begin to cut our grass! Why, what progress could we make in haying, even in the best of weather, if we should delay cutting the grass till eleven o'clock? Most of us calculate to have all the cutting done before eleven, that we may have some time to shake and dry the hay.

There is not, in all probability, one farm in forty in New England that could be benefited by the use of a mowing machine of the best cut. Large and smooth fields are the surfaces for large and heavy machines to operate upon, aud we have but few, comparatively, where the best cutter would be of any advantage.

The labour of mowing by hand is done when nothing else relating to the business of haying can be attended to, and we think it will be a long time before a large portion of our farmers will lay aside the hand scythe to follow after cattle to cut their grass. Indeed there are so many patches of grass where no one would think of using anything but a common scythe, that scythes must still be used by every farmer, great and small.

Horse-rakes are quite a different affair, and any farmer of small means can well afford to have one. In many cases, one man with his horse will rake as much in one hour as six men will rake by hand—and this is done at a time of day when labour is worth twice as much as in the morning.

From the Journal and Progressive Farmer.

How to Raise Locust Trees.

Messrs. Wells & Spangler.—I have received the second number of your Farm Journal, and have thrown together a few suggestions upon the paragraph "Information Wanted," and hope and trust it may lead to the collecting and procuring all the further information desired, which would be worth millions to our country if properly executed.

I am happy to inform your correspondent how he may raise locust trees as easily as he can corn. The first object is to have good seed, and then when he is ready to plant, let him put his seed into a large vessel and pour plenty of boiling water upon them (nothing short of boiling water;) let them stand until cold, and then pour off the water, and they are ready for planting. If the seeds are scarce they may be kept until they swell and begin to sprout, when by a dexterous operation with a little water in a basin, the swollen seeds may be separated, and those not swollen be treated to another application of hot water, not quite boiling this time. If they are designed for a nursery, plant in drills three and a half feet apart, so that they may be worked; but if intended for a grove, then prepare the ground thoroughly and manure it well, mark it out the same as for corn, and then plant from five to eight seeds every second, third, or fourth hill, and every second, third, or fourth row, as they are desired to stand thick or thin upon the ground; and cover them lightly, stepping on the hill after covering. Then plant the balance of the field with corn in the usual way, and work them well, and see which will be the tallest in the autumn. The next year it should be worked the same way with corn or potatoes, and then work the ground a year or two without planting, when it may be sowed down

with clover and let alone. The second year it would be well, if there should be any missing hills, to fill them up from those too close together, and if there is occasion to use the surplus trees, they may be taken out when wanted; but it will do the plantation no hurt to let them stand, as the strong ones will choke out the weak ones. If a grove is the object, let the seeds be planted on the ground where it is desired to be, and close enough to trim themselves as they grow. No knife should be used on a young locust tree, as the borers always follow a knife or an axe. If they are intended to stand in rows, the seed may be planted with Dickey's corn drill, first mixing enough fine sifted sand or earth with them to prevent their coming too close. The spaces between the rows should be cultivated in corn or potatoes. I have some acres of locust trees planted the last of May, 1855, in this way, and they stand now from three to six feet high, and I presume in one summer more they will be from ten to fifteen feet, but they are growing on rich prairie ground.

I take occasion from this paragraph of yours to endeavour to call attention to a subject of vast importance to this continent, and especially to the prairie portions of it, which are not very small or insignificant. A well digested article, or a series of them, instructing us properly how to raise all kinds of valuable timber from the seed, and also how and when to prepare, gather and keep the seed, would be a priceless boon to a large portion of this continent, and not without value and interest to all. In Europe, I believe this subject has received a large share of attention, and it is not less important here, —but no one out of the great cities, where access can be had to all the written authorities on the subject, or professional cultivators, understands the matter thoroughly. I tried nearly a year ago to awaken "The Working Farmer," or some of its able contributors to the importance of the subject, but without success. Can you not, Mr. Editor, either take up this subject yourself, and instruct us how to raise magnificent forests in the West, or induce some one else who is competent for the task to do it for your Journal? But in order to be useful, it must begin at the beginning and go through to the end, and not only tell us when to gather the seeds of the different trees, but how to preserve them, and then how to make them germinate? I know, for instance, that if you keep the seeds of the common red cedar for two years in moist earth, they will germinate the second spring, but this is a long time for an American to wait. I also know that there is some process by which they can be made to germinate immediately, and the trees raised nearly as soon and with as much certainty as cabbages, for I have seen it done, but the man would not tell how. Now, I dare say, you will agree with me that this ought not to be a secret, but so it is,—and if any man wishes as I do to raise a forest on the prairie, and show to others how it is done, with no other light than is contained in the ordinary works and journals upon agriculture, gardening, and botany, he will be years before he takes his first step aright. I have been two years seeking for information and procuring seeds. I have spent many dollars and consulted many books, but all in vain. I have bought seeds at very high prices in your city, and have gathered others myself, but when planting time comes they will not germinate, and with the exception of thirty or forty cypress trees from four or five dollars worth of seeds, I have nothing to show either for my money or labour, always excepting the beautiful young forest of locust trees procured as above stated.

GEORGE GREEN.

Belvidere, N. J.

Strangles, or Horse Distemper—Remedy.

Few diseases attack the horse more perplexing in their effects than Strangles. So little can be done to relieve the sufferer, and his ailment is so stubborn and unyielding, allowing neither food nor water to be taken when the disease is at its worst stage, that the animal has at least the appearance of being very ill. Young horses are the most subject to this disease generally in the fourth or fifth year, and usually occurring in the spring it is doubly provoking to the farmer, whose work is put back or hindered.

All horses are subject to this disease, and probably none escape. "There is no preventive," says Youatt, "nor is there

anything contageous about it." This is certainly contrary to the belief of many farmers, although we are inclined to think that it is not epidemic,—for horses are frequently taken with it which have not been exposed; and many horses have been exposed without being subject to it. Mr. George H. Dadd differs from Youatt in his *Modern Horse Doctor*, and attributes the disease to "depriving animals of those blessings which nature has in store for them in their unrestrained state." And yet, after giving his decided opinion that it is the result of *deprivation*, he will not pronounce it not "catching," but advises that all animals affected, be removed from the presence of healthy ones.

Youatt describes the disease as follows: —"It is usually preceded by a cough, scarcely distinguished from common cough, except there is more discharged from the nostril, of a yellowish colour, mixed with pus, and generally without smell. There is likewise considerable discharge of ropy fluid from the mouth, and greater swelling than usual under the throat. This swelling increases with uncertain rapidity, accompanied by some fever, and disinclination to eat, partly arising from the furr, but more from the pain which the animal feels in the act of mastication. There is considerable thirst, but after a gulp or two the horse ceases to drink, yet is evidently desirous of continuing his draugth. In the attempt to swallow, and sometimes when not drinking, a convulsive cough comes on."

The treatment for this disease recommended by Youatt is, "blister the swelling under the throat, and as soon as it is soft, apparently containing matter, it should be freely and deeply lanced." The usual practice we believe is, to let them burst internally. This, he adds. "should never be allowed;" but inasmuch as most farmers have neither the necessary implements or skill of surgery, we should be slow to recommend its practice. The patient should be protected from taking cold, and it may be well not to let him drink of water much chilled by frost. When suffering under this disease, the horse has but very little sense of taste, and in his drink a "little cream of tartar" and powdered cayenne pepper may be given with good effect. Dr. Gardner, who has had much experience in this disease, says that he always treats them successfully as follows: If the animal is not past eating, give powdered cayenne pepper in its oats, and when further advanced let it inhale the pepper after the manner of "taking snuff." Also put tar and the pepper mixed, into the nostrils. The Pennsylvania Dutch farmers, who are somewhat celebrated as veterinarians, feed the animal mustard seed with its mess, or cause them to snuff it when powdered as above. One effect produced by these remedies is to clear the throat by sneezing and coughing, so that the breathing is far less difficult and painful.

It is the opinion of Dr. G., above named, that this disease is contagious, but if properly treated it need not be dreaded nor avoided. He thinks death will follow in very few instances when the animal is properly treated. After recovery, the animal should be as little exposed to taking cold as possible for considerable time; at least *so long as the cough hangs about it.*

J. SANFIELD.

ILLINOIS, July, 1857.

Rural New Yorker.

Swallows against Flies.

While on a late visit to a friend's residence in the country, we were most agreeably surprised at finding an unusual scarcity of flies, musquitoes, and the whole tribe of winged nuisances which have there, in years past, warred against the peace and comfort of both bipeds and quadrupeds. The change was readily accounted for upon learning the following facts:

Last May, about one hundred and fifty swallows made their appearance and commenced building their nests under the eaves of a new log barn. As soon as their operations were discovered, a cleat was nailed along the boards, which were painted, and thus better facilities afforded the swallows for attaching their nests. Thus encouraged, the whole feathered company at once set to nest-building, and in three weeks time, between seventy and eighty of these mud fabrics were completed; and in about one month more, each of these was occupied by from three to six tenants. Your readers can easily conceive of the immense sacrifice of insect life required to feed such a numerous

company. The result has been as before stated. Add to this, the joyous warblings from these feathered songsters, and what a contribution of pleasure and comfort!

To legislatures in general and the whole community in particular, we say, encourage bird-raising. Don't suffer wanton sportsmen to enter your fields and prey upon these friends of man and beast. Show your regard for your own and the welfare of the community by sparing the birds.—*Traveller.*

Prices.

During the last few years prices of most articles of commerce have been high, relatively, to the rates of former years, and various causes have been assigned for this, the chief being the alleged influence of gold. This is no doubt the case to some extent, but the operation has been moral rather than physical. It has been the influence of the idea upon men's minds of a greater supply of gold which has rendered them more interprising and more disposed to embark in undertakings of all descriptions, whereby a greater demand for materials and goods of all descriptions has been brought about. It is to be doubted whether if the greater supply of gold had taken place silently, and from old sources of supply, whether any actual disturbance would have occurred. When the mines of Peru were first discovered, and the metals began to flow towards Europe, it was in an age of the world when the commercial interest was undeveloped, and when the means of spreading information hardly existed, as compared with the present day, consequently no practical effect upon prices occurred for more than 20 years after the discoveries. On the contrary, with the discovery of the mines of Australia and California, men's minds became at once excited to enterprise, and credit was at once extensively brought into requisition, as a means of realizing the anticipated profits of gold influence. From Europe and the Atlantic States large quantities of goods purchased on credit were sent to the gold countries. England exported $70,000,000 to Australia in 1853, and lost nearly the whole of it. The United States exported and lost largely, as did other countries. The actual effect of gold was hardly to compensate for these losses. The Russian war consumed a large amount of capital, and carried off annually an amount of gold equal to the annual product of California, to be spent among the Turks and half-civilized nations of the East, whence it has never returned. The general result was high prices for goods and produce, which in their turn naturally stimulated production, thus compensating the usual absorption of capital for railroad building, war, and exports to gold countries. The demand for all those purposes has ceased suddenly, while aided by good harvests supplies are abundant. Wool, silk, cotton and food are all abundant, in face of a lessened demand, and some of them have fallen considerably, and the fall has paralyzed consumption among all producers, as well farmers as manufacturers—it follows that there is no trade. The farmers are indisposed to sell produce at low prices, choosing rather to economize expenditure. The factories have everywhere felt the effects of the rise in the value of cotton, and the lessened demand for cloth. Many of them have suffered losses on the last half year. Some of them, like the Atlantic Mills, which sold a large stock of nearly 3,000 packages in the moment of panic, have suffered large loss; and the diminished purchases of cotton since Sept. 1st by the spinners is equal to 40 per cent. of the whole year's make of goods. Nevertheless, cotton which rose to 16c. at the close of the crop year has since fallen to 9½c., and is now apparently again rising, notwithstanding that 9½c. is a high price, in view of the value of goods, and one that leaves a large margin to planters. The crop and price being the average rate at which exports were officially made, with average annual quotation for Uplands in Liverpool, were as follows:

	Crop. bales.	Average price. cts. mills.	Value of crop.	Liverpool price. d.
1852	3,015,029	8-05	$102,965,743	5⅜
1853	3,262,882	9-85	137,011,044	5⅞
1854	2,930,027	9-47	117,933,587	5⅝
1855	2,847,339	8-74	101,384,204	5¾
1856	3,527,845	9-49	142,289,801	6
1857	2,939,523	12-50	159,360,000	7

The average price of cotton for the eight years ending with 1849, was 7¾c. The crop of 1845 sold at 5-92c., and that of 1849 at 6c., yet those were fair years. In the last six years the range has been very high, and the product of the planters greater than ever before. In 1836 the price ranged 16 cents 8 mills, giving for the whole crop a value of $85,000,000, or scarcely more than one-half the value realized in the past year. The value of the last two crops has been equal to THREE times that of 1855; that is to say, the planters have received pay for three crops, while they have incurred the trouble and expense of putting up only two crops.

It is evident that so high a price for cotton could have been attained only by a concurrence of causes. These were—the Russian war,

which diminished the supply of linen; the disease among the silk-worms, which cut off the raw material, and the shortened supply of wool, causes which carried the prices of all these articles to exorbitant rates, and by process of substitution, which always takes place under such circumstances, gave a greater value to cotton for mixture with other fabrics. All those articles are now becoming cheaper under larger supplies and the liberating of stocks through the failure of speculative holders, while an immense check has been given to the consumption of goods in all quarters. Cotton has therefore fallen from its extreme high rate; as compared with former years it is still high. It has not become so cheap as in 1843, after its fall from 10½c. in 1841, to stimulate its purchase not only for holding by manufacturers, but even by paper-makers as cheaper than rags. Notwithstanding, the low point seems to have been reached. The coming year has the aspect of low prices for food and money, elements in former years of large consumption, but it would seem to be the case that prices of goods must, under the influence of diminished production advance to rates which will stimulate manufactures.—*U. S. Economist.*

United States Exports.

The immense exports of the past year have generally sold well abroad, but they have been to a considerable extent on Southern account. The articles of Southern origin that have been exported have for the most part been in active demand and sold at high prices. Cotton, in particular, has done well during the past six years. Some years since, the Hon. Dixon H. Lewis, of Alabama, in his place in the United States Senate, said, in discussing the free-trade question, that if the planters could be guaranteed 6c. for cotton they would be well satisfied. That price would give them a handsome profit. Taking that fact as a basis, we may estimate what has been the prosperity of that section in the last 8 years, in which the price has fluctuated from 8.05c. to 12.11c. per lb. The whole crop and general average has been as follows:

	Crop. bales.	Per lb. cents.	Value of crop.	Value exported
1850	2,096,706	11,30	$104,183,300	71,984,616
1851	2,355,257	12.11	120,118,107	112,315,317
1852	3,015,029	8.05	102,965,743	87,965,732
1853	3,262,882	9.85	137,041,044	109,410,404
1854	2,930,027	9.47	117,933,587	83,596,220
1855	2,847,339	8.74	101,384,204	88,143,844
1856	3,527,845	9.40	142,289,801	128,382,351
1857	2,939,519	12.50	159,360,000	131,557,859
Total	22,974,604		$983,867,786	813,362,343
Average	2,871,825	10.05	122,983,473	101,670,292

This gives an average of a little over 10c. per lb. If we allow the cost of raising to be 5c., in order to leave a satisfactory profit at 6c., then the profits on cotton for eight years have been $491,900,000, or in round numbers five hundred million dollars to the Southern interests. It has not, however, been cotton alone, but rice, tobacco, and breadstuffs have been exported in increasing volume and profit. Of breadstuffs, the exports from Virginia form about one-fifth of the whole export, and if we distinguish articles of Southern origin from others, the United States exports stand as follows:

	1850.	1857.	Increase.
Cotton	$66,396,967	$131,575,859	
Tobacco	5,804,207	20,260,772	..
Rice	2,569,362	2,290,400	..
Sugar	24,906	190,012	..
Hemp	8,458	46,907	..
Naval Stores	845,164	1,638,728	..
Breadstuffs	2,407,506	9,624,638	..
Total South	78,056,570	165,517,316	87,490,746
North	62,696,637	113,360,397	60,663,760
Total	130,753,207	278,907,713	145,154,506
Gold	956,874	60,078,352	59,121,478

This large increase of Southern articles of exports has taken place upon the natural increase of the hands employed, and without the outlay of any considerable capital. The crop of 1857 was but 5 per cent. over the average of the eight years, but it brought 25 per cent. more money. It was about the same in quantity as that of 1854, but it realized $42,000,000 more money. Nearly the same hands, land and money capital have realized this large

increase in values. At the North and West an immense amount of capital has come from abroad, and been re-invested in those industries that have—aided by war and famine years abroad—produced the increase in surplus exported. The immigrants, with their wealth, who have flowed over the North and West in such numbers have failed to enhance the exportable surplus of the country in the same proportion that it has been enhanced by the comparatively stationary numbers and capital of the South. California has largely increased her exports of a commodity which is of no value except to export. But the process of that production has absorbed as much capital as the export of gold has brought back into the country; that is to say, if we have got cloths, wines, sugars and teas from abroad in exchange for the gold, as much of other industrial products has been consumed in the process of digging. In the West, the location of new lands, and the building of new roads and towns and cities, has absorbed as much capital as has been reproduced. The manufacturers of the North have doubtless found the means of extracting from the South much of its increased means, in exchange for manufactures, and the South has generally paid up sufficiently well to compensate for Western deficiency; but the South has now reached a position in which she no longer depends upon advances. The article of cotton, on which the world depends, is her monopoly, and she has the capital to govern it. The machinations of Threadneedle street have been found powerless in the last two years to affect the value. The combinations of spinners are of no avail; the importation wants exceed the productive power of the South. The vast sums invested in machinery, on which hungry crowds depend for support, are valueless without a sufficiency of the raw material, and the supply of that material is a close monopoly. The position of cotton is similar to that of quicksilver, before the California discoveries. Formerly, the successful workings of the silver mines of Mexico depended upon the supply of quicksilver. That article was to be had only at the ancient mines of Almaden in Spain. The Spanish Government, in its exigencies, was obliged to borrow money of the house of Rothschild, who exacted the Almaden mines in pledge. They immediately put up the price from $40 to $60 and $80 per quintal. The result was the stoppage of half the silver mines of the New World, which could no longer be worked at such cost of quicksilver. The short supply of silver this occasioned was one of the causes of the appreciation of that metal. The course of events has hastened the spinning of cotton far beyond the production of it, and many factories must stop until the general level of goods rises, to meet the altered position of the raw material. The best appointed factories, with the newest and most modern machinery, can still have a margin for the fine goods; but the older factories, which run on coarser numbers, feel the advance in cotton first, and must find a remedy first.—*U. S. Economist.*

From the Southern Cultivator.

Chinese Sugar Cane—A Humbug.

EDITORS SOUTHERN CULTIVATOR:

The many encomiums that have been passed on this celebrated plant by the literati of the country, might well deter all persons of ordinary capacity from a free expression of their opinion about its merits or demerits, but I see now a number cooling down, which gives a chance for all ordinary men to express themselves freely. Being numbered with that class, Messrs. Editors, I am bound, from the knowledge I have of it, to pronounce it a humbug, and in doing so, should I be believed, I am sure no one's pocket now would be made any lighter, as it has proved itself to be a very prolific plant, congenial to every clime, and no farther demand for seed; still I have never seen one barrel of sugar made from it, yet I know, however, it possesses sugar properties; but every plant or root having sugar in its composition is not intended for sugar or molasses. For instance, the sugar beet and watermelon bid fair, at one time, to compete with the sugar cane on the coast; but they were only paper competitions. For we now find the watermelon used as God intended them to be used, and are worth more in their natural state than if made into molasses or sugar. And the sugar beet is no longer good for sugar, but used for stock. And I will also mention the sugar tree molasses as being the best I have ever used; and sugar of good quality can be made from that; still it has been dropped as an article that would not pay. And I admit that an inferior article of molasses can be made from this Chinese Sugar Cane, as it is called, but will not compare with the molasses made from the cane on the coast, either in quality or quantity. And to go to the trouble of separating the gluey acid substances from the sugar property, I think would be a more difficult job than one of my neighbors met with in trying to separate a gourd of molosses and lard that was stolen from his house by a negro and mixed for the convenience of transportation; he overtook him, however, in a short time and

recovered his gourd, and on his way home met myself and H———t, who told him the negro had fixed it up just right, as it was then ready for frying his fritters, and sweetening them at the same time.—L———n, however, said he wanted a part of it for other purposes, and took it home to let it settle; he then endeavored to pour off the lard from the molasses; but said, in his own language, "when the fat started the molasses came with it," and finally concluded to use it mixed. And I say in the case of this Chinese syrup, "that which God hath joined together let not man put asunder." It is just right; for while the acid keeps everything cool, the gluey substances act as a clincher to hold all fast until the nutritive properties passes to the system.

As to making crystalized syrup, information was sought through our Minister at Paris, Mr. Mason, and responded to by M. Vilmorin, of France. He thinks, by letting the stalks get perfectly ripe and the syrup boiled down to a certain density with the addition of a portion of lime, sugar might be made. This, though I understand from him as amounting to but little more than speculation, as I do not understand him to say he ever made sugar from the syrup. But speculation won't do now, as sugar mills, boilers, and all the fixtures are being prepared for making sugar.

I never count the chickens before they hatch, still I must think they have fallen on the right track at last, as some have set sail for Yankeedom; and I contend that any people having the ingenuity to change a Northern wood into a tropical fruit, and sell it in pieces about the size of a nutmeg for a "bit" each, ought to crystalize this Chinese syrup. Still I cannot think, if effected, that our sugar planters on the coast would be badly injured by the competition. But, says one, it is not only good for sugar and molasses, but fine for stock of every description, poultry, and for making bread.

I am told it makes 50 bushels of grain to the acre; and I see one intends making meal of all the seed he has to spare. It also makes the best of fodder. If so, it may supersede Dr. Lee's corn stalk fodder, as it not only makes one crop, but sprouts up again from the roots and makes an overwhelming second crop of fodder, and I will add to the catalogue by saying it will make good brooms.

Now, Messrs. Editors, don't this "beat the nigger's rabbit all to pieces." But the sugar beet bid fair, at one time, to do the same; still that, with other cheats, is now sleeping with the many humbugs that have gone before, and only remembered as mementoes of the credulity of man.

Now, sirs, for the information of those who never have experimented with this Chinese Sugar Cane, I propose bringing forward proof to support the assertions I have made. One of my neighbors, last year, made, on one acre of good land, about 70 gallons of second quality molasses, that, at 18 cents, New Orleans prices, makes $12.60. Will not one acre of good land in the South make more planted in corn or cotten? Again, I saw in the New Orleans *Delta* last summer, the arrival there of upwards of one hundred barrels from the Balize, put up in nice order, and only offered at the prices that fermented molasses was selling at in the city.—Whether they obtained their prices or not I cannot tell—the presumption is they got no more. Does this prove it to be a first rate article? Well, if it will not make so much, nor the quality so good as that made from the Cane on the coast, of course it must be a cheat.

In conclusion, Messrs. Editors, I must think the American people deal largely in humbugs. Were they not humbuged, sirs, when they were induced to spend near one million of dollars in building triumphal arches, and for gun powder to announce the arrival of Lafayette in every city and hamlet in the United States, whilst the remains of Nathaniel Greene, second only to Washington, was supposed to lie in your State without a head stone to mark the place where he was interred? And were they not humbuged, by giving Jenny Lind as much or more for her songs, whilst as good music could be made by a negro on a corn stalk, for nothing? And were they not humbuged when they gave Kossuth ninety odd thousand dollars to aid him in freeing Hungary, when all the combined powers of Europe could not have done it; and when they were only aiding him to live in princely style in Europe off the money that would have been better applied to the wants of our poor widows and orphans at home? And were

we not humbuged when the Missouri Compromise was repealed to give the South free access to any of the Territories of the United States, when we had good reason to believe the abolitionists would take the whole?

But, Messrs. Editors, I am admonished that yours is an Agricultural Journal, and I will not digress farther. I have only brought forward the above cases as illustrations to show how easily we can be cheated. One other idea, and I am done.

Yours is a Southern Journal, patronized by the South, and intended to improve Southern Agriculture, and while we have already the Sugar Cane on the coust, and better adapted to the climate of all the Southern States west of North Carolina for sugar and molasses than this Chinese Broom Corn, I can't see why we should be seeking out information for the benefit of the North. Could I control the products of the South, I would put those negro stealers of the North on this Chinese Broom Corn molasses, and scratch them with hemp shirts until they would, willingly, send back the negroes they have stolen, to the cotton and sugar plantations to make better articles. Humbuggery, though, seems to be part of our nature; it not only runs through Church and State, but is hedging up the pathway of the Agriculturist. Can agricultural science ever advance with so many clogs? We want facts, proven by honest, practical men. I like a stubborn man—one that stands on his own foundation, immovable, until he is moved by the power of truth.

E. JENKINS.

Horse Pen, Miss., January, 1858.

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[Stubbornness is all very well in its way, but it is to be regretted that the whole country should have been allowed to persist so long in the idea that the Sorgho is, after all, of some value. Such a notion prevails very generally at present, and we fear our respected correspondent will have a herculean task in dissipating it. We have often expressed our own opinions on the subject, and refrain from reiterating them. Our columns are, as usual, open to a moderate discussion of the question, confined strictly to its agricultural bearings.—EDS.]

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From the Scientific American.

Glucose and Syrup.

MESSRS. EDITORS—I have seen it stated in some papers that glucose or grape sugar never crystalized. This is a mistake. Glucose is made in large quantities from potatoes, in France and England, and has as fine and crystalline an appearance as any sugar. For a long time only syrup could be produced; but it was found at last that if the purified syrup was rapidly evaporated to a density of 45° Baume, and then left to cool slowly in a warm place, it all crystallized in a solid mass, but if stirred occasionally, granular crystals were obtained. This sugar is much used to adulterate other sugar, but its sweetening properties are greatly inferior to cane sugar, the ratio being variously estimated at from two or three to five. Honey is a mixture of grape sugar and fruit sugar. The grape sugar in it is mostly capable of crystallization; it often separates from the fluid portion, and is then said to be candied. This sugar is often found in raisins in the form of small gritty crystals, hence its name. As to the value of the Sorgho Saccharum syrup as a marketable article, I am not prepared to speak, but I do not think it can be sold here. People buy some of it from curiosity, but seldom more than once. I have been assured by those who have the most of it, that they can find no market for it, and they intend to distil it, for which purpose it is very well suited. As many as 225 gallons of moderately concentrated syrup have been produced here from an acre of ground planted with the cane.

Interesting reports on the optical and other relations of crystalline and amorphous grape sugar, and on the other varieties, have been made during the past year by Dubrunfait, Biot, and Bechamp, in France, and by Erdman and Kobill, in Germany. J. CAMPBELL.

Dayton, Ohio, March, 1858.

Cleaning Saddles, etc.

THE following is a good recipe which will give saddles and bridles a good polish, and be entirely free from all stickiness:—The whites of three eggs evaporated till the substance left resembles the common gum, dissolved in a pint of gin, and put into a common wine bottle, and filled up with water.

Premium Essay on the Farm Horse.

BY THEODORE BROWN, OF JEFFERSON CO., KY.

The following Essay was awarded a premium of $40, offered by the Editors of the *Louisville Journal*, for the best upon the subject. The award was made by judges appointed by the Directors of the Southwestern Agricultural and Mechanical Association. It will repay a careful perusal. In no section of the Union are the principles of breeding better understood than in Kentucky, and in accordance with our views, of the absolute necessity to meet the requirements of the country in this department of Farm Economy, it is our determination to give special attention in our pages to the subject.—*Car. Cult.*

To the South-western Agricultural and Mechanical Association.

Heretofore it has been too much thought that the broken down, refuse stock of the turf, the saddle, or the dray would still answer for the farm. It is now, however, believed that, though individuals of these several classes may be suited for farm purposes, neither class as a whole, is competent to the efficient performance of all the duties of the farm horse. Those duties are of a most diversified character—every change in the seasons, every variation in the roads, or in the surface, constitution and condition of the soil calling into play different powers of the farm horse. Thus the wagon, with a light load, or a firm, well-graded road, requires in the horse wind and action and spirit combined with gentleness; while on muddy or hilly roads it would call for weight of carcass, tough, large muscles, true, steady pulling, and power of endurance. Plowing, too, is no less varied in its demands, its heavy, constant, long-protracted work taxing the stronger powers, and the cultivation of the crops, particularly in July, imperatively demanding wind and strength both, and sufficient evenness of temper not to throw away either. And in all sorts of farm work there is need of health and thrift in the animal to perform it well and with justice to itself.

What race in America "is sufficient for these things?" The Conestoga is not, for wind and action are wofully deficient in this breed. The race horse, on the other hand, possesses sufficient wind and action, but generally lacks size and good temper, being restive, vicious and unsafe till almost worn out by age and hard service. The Canadian and Morgan horses both combine excellent qualities, but too often lack size. A cross upon the Conestoga and race horse with the Morgan, would doubtless produce a good race, but similar crosses on better draught horses than the Conestoga have already been made known in England and France, and breeds gotten thought to be especially adapted to the farm; and it would therefore be a quicker way of getting what we want, to import one or more of these breeds. And is it not the peculiar province of your association to encourage such importation by liberal premiums? The breeds referred to are the Cleveland Bay and the Clydesdale of England and the Percheron or Norman diligence horse of France.

"The Cleveland Bay is generally clean and well made in most of the parts, being very strong and active, answering perfectly for the team, coach and saddle. There are few horses capable of greater or longer continued exertion in any of these intentions than these."—*Dr. Reese's New Encyclopedia.*

The Clydesdale is a valuable breed of cart horses, bred chiefly in the valley of the Clyde, hence their name. They are strong and hearty, have a small head, are longer necked than the Suffolk, with deeper legs and lighter carcasses."—*Farmer's Encyclopedia.*

Says Mr. Harris, of Moorestown, N. J., who imported a pair of Norman horses: "I have been frequently questioned as to my reasons for selecting this horse in preference to the English draught horse, whenever brought to this country, must prove a failure; he cannot move out of a walk, which is saying quite enough for him." (He probably refers to the heavy black horse, not to the breeds above described.) "The true Percheron or Norman diligence horse, on the contrary, combines more strength with activity than any other horse I ever sat behind. All travelers, on entering France are struck with the properties of these horses as displayed in drawing the ponderous machine called a diligence, by which they are conveyed through the kingdom at the rate fully equal to the average of stage traveling in this country. English horsemen confess that their road horses could not

hold out the same pace before the same load.—*Farm. Enc.*

One or all of these three varieties might answer without crossing. But it might be necessary to cross with the race-horse or with the Morgan, just as wind and action, or wind, action, and good temper seemed most needed. Mr. Stephens, the distinguished author of *The Book of the Farm*, thus describes a cross of this kind on the Clydesdale: "He is not a thorough-bred Clydesdale, having a dash of the coaching blood in him, a species of farm-horse vey much in use on the Borders, and admired for their action and spirit. The gelding exhibits such a form as to constitute in my estimation, the very perfection of what a farm horse should be. His head is small, bone clean, eyes prominent, muzzle fine, and ears set on the crown of the head. His neck rises with a fine crest along the mane from the trunk, and tapers to the head, which is beautifully set on, and seems to be borne by the neck with ease. His limbs taper gradually from the body, and are broad and flat—all excellent points in the leg of a draught horse, giving it strength and action. The back of the fore leg from the fetlock-joint to the body is straight, indicating no weakness in the limb—a failing here causing the knee to knuckle, and rendering the horse unsafe in going down hill. The hind legs, as well as the fore ones, stand directly under the body, forming firm supports to it. The body is beautifully symmetrical. The shoulder slopes backward, the withers being light and thin. The sloped position of the shoulder affords a proper seat for the collar, and provides the muscles of the shoulder-blades so long a lever as to cause them to throw the fore-legs forward in a walk or trot; and with such a shoulder a horse cannot stumble. The back is short, no longer than to give room to the saddle. The chest is deep, giving it capacity for the lungs to play in and room for the muscles required in draught. The top of the quarter is rounded, the flank deep, and the hind-quarter long. On looking on the side profile of the entire animal, the body seems made up of large quarters, joined together by a short, thick middle, suggesting the idea of strength; and the limbs and neck and head are so attached to the body as to appear light and useful.

"In a well formed horse, I may remark, the line from the fetlocks to the elbow-joint is equal to that from this joint to the top of the withers. In a low-shouldered, leggy horse, the first line is much longer than the last; but, in the case of this horse, the body is rather deeper than the leg is long, realizing the desideratum in a farm horse of a thick middle, and short legs. The line across the rib is, like the back, short, and the ribs are round. He is 16 hands. His walk is stately, and he can draw three tons on a level ground, including the weight of the wagon. He is a well known animal in Edinburg, and is generally admired. He is the property of Messrs. Howey & Co., the great carriers from Edinburg into England."—*Farmer's Library*, vol. iii, No. 10, pp. 439, 440.

It would be useless repetition to detail the points of the brood mare. From whichsoever of the breeds above recommended she should be selected, she should be a perfect specimen of that breed. As a general rule in breeding animals of all kinds, when there is much difference in size, between the male and female, the latter should be the larger—because the fœtus will probably be large, and require more capacity of womb than can be afforded by a small female. This is a point much insisted on by Lewis F. Allen and other scientific breeders. A case has occurred this season on the farm of the writer, demonstrating the error of the opposite practice. He had bred a fine blooded mare, about 15 hands high, to a large draft horse, and the foal came into the world with a crooked leg. True, it has since become straight, but this might not always be the case. The mare, as well as the horse, should be known to be of good families on both sides; otherwise the foal may inherit defects from remote ancestors. During pregnancy the mare should be worked, or ridden gently, never put into a cart, and turned out for a month or two before delivery. About the time that event is expected, hogs, mules and colts must be carefully excluded from the lot—a neglect of this precaution may cost the life of the foal. The foal should be dropped during the grass season. The weather is then mild, and pasturage abundant and cheap. If worked while suckling, the mare should be fed well and not heated—and the colt must be suckled

twice a day, besides being with the mother at meals and during the night. This is a most convenient time for gentling the colt—and a little pains now, greatly facilitates the breaking when grown. If the colt comes in the fall, it should run with the mother during the winter, on pasture of grain or grass if convenient, but, if not, on good clover or timothy hay, cut in the blossom state. Curing hay at this stage makes it sweeter, more nutritious and digestible. John S. Skinner records experiments proving this conclusively. Grain enough must be supplied to keep both colt and dam in good order. Shelter them also from the north-west winds, and from rain and snow. This can be done cheaply with rails, forks and straw. When a colt is weaned in the fall, it can be treated during the winter, just as a mare and colt would be if together. Give a colt company for a while after weaning; but be sure it is good company. A breachy horse or colt should by no means be selected for this purpose; it has a contagious habit more to be dreaded than the distemper—the disease being curable, the habit incurable.

If the mother of the colt is breachy, she should be kept in a secure lot, and yoked, if necessary, to keep from jumping. A breachy animal is so annoying, corrupting and expensive on a farm, that unless uncommonly valuable, it should be gotten rid of. The growing colt should never be allowed to get thin, abundant nutritious food developing the bone as well as muscle of a young animal. "The ponies of Shetland, and the still more diminutive steeds of China, when bred on rich English pastures, rapidly increase in size. The horses of Arabia do the same."—*Farmer's Encyclopedia*—article, "Wild Horse."

At three years of age the young horse, being strongly and properly geared, can be put to work in a wagon beside a gentle horse, and in charge of a careful, experienced driver. It should not be made to pull much at first, but merely to walk along gentle, and get accustomed to the wagon and gear. It can be taught to pull afterwards. As soon as it becomes chaffed, or galled, it should be turned out till well. Besides the inhumanity of working a colt or even a grown horse with sore shoulders, it forms a habit of balking, and creates a sore knot ever afterwards in the way of the collar, and liable to gall whenever the work of the animal is at all severe or protracted. At four years of age the young horse can be put at almost any kind of work for which it is sufficiently gentle, but not kept at it long enough, if very laborious, to break down or be strained. The five year old need not be favored, and the six is in the prime of life if well broken.

Stables should be kept clean and well litered and warm in winter. In summer the horse keeps cooler and more comfortable on pasture at night; and when fed at noon at that season, an open shed is preferable to a stable, unless the latter is uncommonly well ventilated. An experienced plowman recommends washing the body of the work horse in hot weather; he thinks it enables the horse to endure the heat a great deal better while at work. "There can be no doubt it contributes to the health of the animal. The same reasons urged in favor of currying and rubbing would particularly commend this practice and be very refreshing in hot weather, and altogether beneficial unless done while the animal was perspiring too much; in this case it would close the pores of the skin and give cold; this result would also occur, no doubt, in cool, chilly weather." Stephens particularly warns us against washing the horse higher than the knees in winter. "There is danger," he observes, "of contracting inflammation of the bowels or colic, in washing the bellies of horses in winter; and to treat mares in foal—which they will be at this time of the year, in this way, is little short of madness." He recommends watering before meals and rubbing afterwards as a preventive of colic; that plan allowing the food to settle some before the animal is put to active service. In summer, and also in the warm weather of spring and fall, horses at work should be watered between meals. They are too often allowed to suffer for water during the busy season. A cistern with a watering trough adjoining the stable, gives great security for the regular watering of the animal, as well as of his cut or crushed food.

Oats and rye straw cut up and mixed with bran or shorts has long been esteemed by farmers a nutritious, wholesome food,

cheaper than grain-feeding in the old way.

"*Manger Feeding.*"—A mode wherein the wasteful and expensive rack is superseded, and hay instead of being fed separately, is cut up and mixed with the grain—has been much approved in England. The reasons why it is both cheaper and better than corn or oats and hay separately, are very satisfactorily given by Youatt, page 372, as follows:

"The system of manger feeding is becoming general among farmers. There are few horses that do not habitually waste a portion of their hay, and, by some, the greater part is pulled down and trampled under foot, in order first to cull the sweetest and best locks, and which could not be done while the hay was enclosed in the rack. A good feeder will afterwards pick up much of that which was thrown down; but some of it must be soiled or rendered disgusting, and in many cases one-third of this division of their food is wasted. Some of the oats and beans are very imperfectly chewed by all horses, and scarcely at all by hungry and greedy ones. The appearance of the dung will sufficiently evince this. The observation of this induced the adoption of manger-feeding, or of mixing a portion of the chaff with the corn and beans. By this means the animal is compelled to chew his food; he cannot, to any degree, waste the straw or hay; the chaff is too hard and sharp to be swallowed without considerable mastication, and, while forced to grind that down, the oats and beans are ground with it, and yield more nourishment; the stomach is more slowly filled, and therefore acts better on its contents, and is not so likely to be overloaded; and the increased quantity of saliva thrown out in the lengthened maceration of the food softens it, and makes it more fit for digestion."

But an improvement even upon the cut and mixed food here recommended by Youatt, has been made since he wrote upon the subject. It consists in crushing grain, shuck cob, straw and hay, and thus giving the *economic advantage* he speaks of to a still greater degree, (for he does not mention the cob, now known to contain a considerable amount of nourishment,) and at the same time saving the horse the labor of grinding down his food, leaving him the time thus saved for repose. The admixture of the roughness (the chaff as he calls it) keeps the ground grain from cloying in the stomach, and the water added in mixing, supplies the place of the saliva furnished to *slow feeding*, for softening the food and preparing it better for the digestive organs. Many farmers estimate the advantages in saving food by this mode of feeding to be as much as one-half. The machinery for crushing varies greatly in the quantity of power required and work executed in a given time. Some can be worked by hand, some by horse-power, and some by steam.

With one of Sinclairs, screw-propeller Cutters he has cut up a four-horse-wagon load of oats in twenty-two minutes, and with Pitt's Crusher he has ground thirty bushels of corn in the ear per hour. (See *Cultivator*, July 1856, page 211. On the same page is described a convenient "Cut-Feed Mixer," intended to prevent the accumulation and freezing of water in the bottom of the box in the winter. The box is a half-circle, and the lid another half-circle, the box containing the feed, and the lid the wheel, with three spokes or paddles, for mixing the food. After the water is poured in upon the food, it requires but half a minute to do the mixing completely. *Boiling* grain for work horses is of very questionable advantage. Stephens (page 547 *Farmers' Library*) gives the results of very careful experiments in feeding boiled food, raw food, and bruised food; the last probably equivalent to crushing. "The two first," says he, "gave results so nearly alike, that it seems inexpedient to incur the expense of cooking food for horses. Bruised raw grain seems the most nourishing, and, in not requiring cooking, of course the most economical mode."

Pumpkins, carrots, beets, turnips and potatoes, cooked or raw, make a very agreeable addition to the horse's bill of fare. The two first are probably the most wholesome and nutritious, and the first and turnips the cheapest.

Horses should be salted once or twice a week. For mares in foal the salt must be free from blood.

An essay on the farm horse would, in the estimation of many, be very incomplete without some mention of the merits of the mule, for they regard this the best of all work-animals for the farm.

Mules are smaller than horses, but when from 14½ to 15½ hands high, are capable of performing any of the ordinary farm work of the latter. They may not be equal to large horses for a single hard pull, but their powers of endurance are wonderful, and their ability to stand heat superior greatly to that of horses possessed of as much strength. In the West Indies, and in the Southern States, they are employed, and exclusively instead of horses. Their docility is greatly superior to that of the race-horse, the only breed of horses matches for them in the heat of the July or August day. In health and thrift and hardihood they have greatly the advantage over horses. They are rarely known to be sick, perhaps never blind, except by accident, can often work a whole winter on a farm without shoeing, can be maintained on less food and cheaper food—the proportion of hay to corn being much greater than with horses, and the whole amount of food no more than two-thirds as great—they suffer less and recover more easily from neglect and abuse, and are so proverbial for longevity that the question has been asked, "Did any body ever see a dead mule?" Some have been known to attain the age allotted to, but so rarely attained by man, viz: three score years and ten; and many have been known to be valuable for work at from 30 to 40 years of age, whereas it is a rare thing for a horse to be worth anything after 20 years. They are better than horses for cultivating crops, their feet being smaller, and their steps more straight and true, and also requiring a shorter swingle-tree, they can be driven closer to the crop without treading on it or breaking it down. Their mischievous propensities are perhaps greater naturally than those of horses; but if they are brought up and treated properly, they are by no means troublesome. The writer owns a pair of mules which have been working on the farm for about seven years, and have never gotten into mischief, except when led into it by breachy horses. Neither have these mules given any appreciable trouble by the stubbornness for which they are thought to be remarkable. In his opinion the stubbornness of the mule results from abuse, and its mischief from negligence on the part of the farmer, whose low fences may tempt the horse as well as the mule to become breachy.

John S. Skinner, in his valuable essay, "The Ass and the Mule," sums up the comparison between the horse and mule, with the opinion that the horse is (all things considered) twice as expensive an animal for farm-work.

In breeding mules for the farm, the best work-mares should be selected. "There are three varieties of jacks, the heavy Spanish jack, with slouching ears, answering to the call of the cart-horse, another Spanish breed called the Andalusian, with ears shorter and erect, of tolerable size, plenty of bone, active and more spirited, answering to the hunter, and the Arabian jack, with ears always erect, of a delicate form, fine limbs, and full of fire and spirit"—though judicious crosses might produce a better jack than either of the three now is, the Andalusian is at present the best suited to the want of the breeder for the farm.—*Working Farmer.*

From the Country Gentleman.

How to Make Lard Candles.

Messrs. Editors.—Having been the recipient of many favors through the columns of your invaluable publications, I propose as far as in me lies, to cancel the obligations already incurred, and as the first installment, I shall offer a recipe for making hard, durable and clear-burning candles of lard. The manufacture of lard candles is carried on to a considerable extent in some of the Western States, particularly Wisconsin, and being monopolized by the few has proved lucrative.—The following is the recipe in to-to. To every 8 lbs. of lard, add one ounce nitric acid; and the manner of making is as follows: Having carefully weighed your lard, place it over a slow fire, or at least merely melt it; then add the acid, and mould the same as tallow, and you have a clear, beautiful candle.

In order to make them resemble bona-fide tallow candles, you have only to add a small proportion of pure bees-wax.

J. A. Robinson.

Belcher, N. Y.

☞ People seldom improve when they have no other model but themselves to copy.

From the Transactions of the Virginia State Agricultural Society, Vol. 2d, 1854.

Report of Agricultural Survey of the County of Nottoway.

BY RICHARD IRBY.

The following survey of the county of Nottoway furnished in response to a series of general queries propounded by the Agricultural Commissioner of the Virginia State Agricultural Society, was prepared by RICHARD IRBY, Esq., and communicated to the Society by the Commissioner in his report, to be found in the second volume, page 49, of the Transactions of 1854.

The numbering and heading of the sections and paragraphs are in accordance with the form and arrangement suggested by the order in which the queries were propounded. What those queries were, will be disclosed in the following report with sufficient distinctness without the necessity of a repetition of them.

I. General Features, &c.

1. The county of Nottoway lies on both slopes of the great ridge, which divides the waters flowing into the Chesapeake Bay on the North, and the Albemarle Sound on the South. It derives its name from the river which rises in its borders, and which was so called from the tribe of Indians living on its banks. Its length is about twenty miles, and mean width about twelve. It contains, according to the last census, 186,912 acres in farms. Its surface is undulating and slightly broken.

2. The upper portion of the county is quite elevated, and from its highest points the Blue Ridge is visible.

3. The climate differs in no marked particular from that common to Piedmont Virginia generally. The streams of water in the county being rapid, and the surface free of swamps and collections of stagnant water, there is no visible cause why the climate should not be as salubrious as any in the State.

4. The base of the soil is granite. This predominant rock differs greatly in different sections of the county. In some the *bastard* or *conglomerate* granite is most common. In others the pure granite abounds, of the finest kind for building purposes.

5. There are no minerals useful for manufacturing or valuable as manures, found in the limits of the county.

6. Neither is there any navigable stream. For other purposes, such as irrigation and milling, the streams are abundant and highly favourable. No considerable body of land can be found on which springs and small streams do not abound. At the falls of Nottoway there is an abundance of water power for manufacturing purposes, which, at present, is not improved beyond what is common.

7. The *market towns* of the county are Richmond and Petersburg, both nearly equi-distant from the centre of the county. The first is accessible by the Richmond and Danville Railroad, which runs through the Northern border a distance of about seven miles, and within seven miles of the Court House. The other is reached by the South-Side Railroad, which intersects the county diagonally, and runs for about twenty miles within its limits, immediately by the Court House. No farm in the county is more than eight miles distant from a depot. In the Southern part of the county, the Lunenburg Plank Road runs from Black's and Whites' Depot, South-west seven miles. From Burkeville, the point of junction of the two roads, another Plank Road is under construction, running South about eight miles into Lunenburg county. By these conveniences, every portion of the county is as accessible to market as, from the nature of the country, it could be made. The complaint of the farming community, heretofore so common, of inaccessibility to market, is, therefore, no longer heard.

II. General Description and Management of Lands.

1. The most of the *soils* in this county might be classed as *clay loam*—the *sub-soil* being generally red.

2. The proportion of *arable* land, or such as has been reduced to cultivation, is large. Of *meadow* land (not subject to ordinary tillage or rotation of crops) there is comparatively none kept for hay, but there is a considerable quantity of land which, by skilful management and attention, could be made to produce large crops of hay. Of *wood land*, or virgin forest, there is a very small proportion, not more, generally, than enough to afford an abundant supply of fire-wood and rails for fencing. Of *swamp* or *marsh* land, there is almost literally none, and what little exists is due to causes which might be easily removed. Of waste land lying out in pine, or as commons, there is a considerable proportion. A great deal of this land was originally the best land in the country, and was cleared and worn out by the early settlers, and then suffered to grow up in pine. A good deal of this has been reclaimed, and its great productiveness, especially for tobacco, proves how rich it formerly was. Being easily reclaimed, a larger portion of this description of land is annually brought into cultivation, than of the original forest land.

3. There are few large farms in the county, and few very small. The general range is from two hundred to one thousand acres. Since the general rise in price of land, a disposition

is manifested to subdivide large farms, which will probably increase until our farms are reduced to one-third or one-half of their present size. This tendency is the reverse of what has existed for the last half century, and is a natural consequence of the cessation of emigration to new countries.

4. The staple crops are those common in Piedmont Virginia generally, viz: tobacco, wheat, corn, and oats. The two former are raised for market; the two latter mostly for home consumption. Since the Railroads have been in operation corn has been sent in considerable quantities to market, when the price is good; still, it is hardly probable that it will ever be raised to any great extent as a market crop. Besides these, the usual small crops, such as potatoes, (of both kinds,) peas, &c., are raised, principally for home consumption.

5. The usual *rotation* of crops for the last twenty years, or more, has been "three-field." Prior to that period the "two-field," or no rotation at all. The former is now most common. Many of those most anxious to improve their lands are adopting the "four" and "five-field" systems, and a few the "six."

6. The general mode of preparing land for tillage is by the use of the "turning plough." For corn, most of the farmers break up their lands with the "two-horse turning plough" in winter or early spring. Some few use the "three-horse plough." General depth of ploughing, from six to ten inches. Tobacco land is prepared in the same manner and at the same time, and land for wheat and oats, when they do not follow corn or tobacco, is similarly prepared, but at a different season. The mode of cultivating these crops is seldom the same on two adjoining plantations. The following mode of preparing and cultivating corn land is becoming popular and now common. Land, after having been broken to the depth of ten inches, to be harrowed previous to the planting of the corn. Corn planted from the 10th of April to the 10th of May, in horizontal rows, 4½ feet by 1½, thinner or thicker according to the nature and fertility of the land. The first ploughing is performed by coulters, or turning ploughs, next to the corn and cultivators, immediately after which the corn is thinned and weeded out. After-cultivation completed with cultivators. Tobacco is generally ploughed twice, scraped down and hilled once or twice. Wheat is gotten in mostly with the small turning plough and trowel-hoe, which are followed by the harrow to level the land and break the clods. Same may be said of oats.

7. It would be difficult to arrive at a correct estimate of the cost of cultivation. Any mode of cultivation can be adopted in this county which is used in Piedmont Virginia, and at not more than average cost. The soil admits of the use of the cast iron turning plough, and of all the improved implements now used in agriculture. The flat lands may be successfully cultivated for corn, at an expense to the owner of about $6 per acre, and high land at a cost of about $4. For wheat the expense per acre is about $2 50 on flat land, and $2 on high land. For tobacco the expense per acre is about eight dollars.

8. The staple crops for market are wheat and tobacco. Corn, as previously stated, is made chiefly for home consumption. The quantities of these crops made in the county, as well of other products, will be found in the following table taken from the census report of 1850:

Tobacco. pounds.	Wheat. bushels.	Corn. bushels.	Oats. bushels.	Wool. pounds	Peas. bushels	I. Potatoes. bushels.	S. Potatoes. bushels.	Butter. pounds.	Home-made Manufactur's, valu'd at	Slaughtered Animals, valued at
2,109,314	71,827	216,991	55,571	10,691	4,384	4,927	7,653	55,570	$10,005 00	$44,118 00

III. General Market Prices of Lands, past and present, and Causes of Rise and Fall in Prices, Rates of Rent.

The general price of lands in this county has been low, but it is now much better than formerly. This was due to the former inaccessibility to market. For the last half century, up to within the last few years, the price of land has averaged not more than $6 per acre. The average price would not now fall far below $10. This rise in price is caused by the public improvements traversing the whole county, and to the present high prices of farm products. A greater portion of the land has been naturally good, and is therefore more easily restored to fertility. The great and unsurpassed facilities to market, will probably bring a good quantity into notice, which otherwise would long lie waste and uncultivated. This cause renders a continued rise in price of lands probable. This will appear much more certain when we consider the known healthfulness of the county, the equal distribution of wealth among its inhabitants, the great amount of labour concentrated within its limits, and the universal spirit of improvement, now so generally diffused among its farmers. The tide of emigration having ceased to flow from the county, its resources must be rapidly developed, and nothing but increased and well directed enterprise and industry is needed to render it second to but few if any of the interior counties in the State. Little land is rented out, as a general thing, and what is, is made up of small and indifferent tracts.

IV. Drainage and Embankments.

1. No tide marshes or swamps are found in the county.

2. There is little swamp land of any kind and little that is too wet to work. The flat

land has been mostly drained by the owners, and the quantity unfit for cultivation is becoming annually less.

4. There has been no attention paid, as a general thing, towards draining the highlands, except by horizontal or guard ditches, which are quite common on the farms in the county. These have been used for many years past, but they have not been laid off and constructed with that skill which will render them productive of the good desired. There is a good portion of up-land too wet and springy for successful cultivation, which, by a proper system of under-draining, would be rendered dry and productive. Such a system would prove far more beneficial than is generally supposed.

V. Implements and Machines for Agricultural Operations.

The most important implement here, as elsewhere generally, is the *plough*. The double and single are mostly used in this section. A few are beginning to use larger sizes. The common varieties are, "Livington County," Clarksville, Cuff and Braces. The large harrows are much used for getting in wheat and pulverizing the soil. The "cultivator" is getting into general favour in the cultivation of corn and tobacco. "Wheat threshers" are very common, and "*reapers*" are becoming more frequent. As yet, the "drill" has not been used for seeding wheat, not from any impediment naturally existing. Corn-shellers, cutting-knives, and machines, &c., are found on most plantations. It may be observed, that as much as the use of labour-saving machinery has increased, there is still a great deal of labour and timber lost by the use of indifferent kinds, and their total disuse in other instances.

VI. Fencing and Enclosing.

The most common kind of fence is the "Virginia worm fence." In regard to its cost, reference is made to the report contained in the "Address of the Farmers' Club of Nottoway," on the subject of the enclosures, hereto appended. Since the publication of this paper, a portion of the county, between the Lunenburg Plank Road and a road lying somewhat parallel to it in the county of Lunenburg, on both sides of Nottoway River, has been placed under the operation of the desired system of enclosure, by an act of the Legislature. This tract of country embraces about twenty farms, on the most of which there are no cross or division fences. The boundary of this section is protected by fence, but within it every man's line is considered as lawful fence. This is believed to be the first instance of the putting into practice the new law so much called for by many farmers, sanctioned by legislative enactment. It has been in operation too short a time to test its benefits.

VII. Grass Husbandry, Grazing and Green or Vegetable Manuring Crops.

1. A good deal of moist or wet land, when lying out puts up in natural grass. One kind —the "wild oat"—is considered valuable as pasturage and for hay. Very little, however, is used for hay.

2. There are only a few meadows kept as such. Most of the fertile plats are sown down in clover or grass, but alternated with tillage.

3. Clover is used very generally and with considerable profit, and is esteemed very valuable as an improver to land and as hay. In the latter capacity, it is becoming more and more used.

4. Clover is mowed about the middle of June, and put up in the manner recommended by Mr. E. Ruffin, several years since, generally called the "Ruffin Plan" with us. When judiciously managed, the hay is considered very valuable. Herdsgrass is mowed for hay to a small extent.

5. As before stated, clover is relied on to a considerable extent for improving land. Peas have been tried by a good many, and are recommended by some as very beneficial.

The usual growth of weeds, in the five-field rotation, when the land is not seeded in clover or grass, is left on the land the year succeeding the first wheat crop, in the rotation. In the three-field rotation these are generally grazed off.

VIII. Live Stock.

1. Horses are kept principally for the work on the farm. Mules are a good deal used. Oxen are kept for slow draught, but seldom used for the plough.

2. Very few cattle are reared for market. They are principally raised for home use and fattened for home consumption. Hogs are raised entirely, it may be said, for home consumption, and not in sufficient quantities for that purpose. Sheep are raised to supply wool for negro clothing, and mutton for the table. Since the establishment of increased facilities to market and rise in the price, a considerable number of muttons and lambs are sent to market, and with a steady demand, this number would be considerably increased. As cattle raising is not pursued as a business as a general thing, not a great deal of attention is paid to it. Too many indifferent and poorly fed animals are kept. They are generally permitted to graze the lying out field in the summer and fall, and in the winter they are fed on wheat straw, corn-stalks, shucks, &c. They are penned at night both winter and summer, in order to secure their offal for manure, and in winter are protected by temporary shelters from the weather, in many instances. Some believe sheltering a disadvantage. Hogs are generally kept like the cattle, except they are fed the year round with corn, and not sheltered. A few farmers keep them in lots and

graze them on clover, oats, &c., in summer. Sheep are suffered to run out the whole year, and as a general thing, are never fed, except in snows or bad weather. A good many graze them on their wheat fields during the winter, and consider that they are not very injurious to it, but frequently beneficial. Horses and mules are raised to a small extent. About four-fifths are brought from abroad. Attention to stock raising, or to improvement in the management of stock generally, is increasing, and it is hoped that our farmers will be enabled in course of time to supply their wants without recourse to distant countries.

3. Horses, mules and hogs are purchased from abroad. Good work horses and mules cannot now be bought for less than about $125 to $150. The price of pork ranges from $5 to $8 per cwt.

4. As to the comparative cost of raising hogs in lots or pens and ranging at large, it would be difficult to determine, as circumstances would generally decide the question. Where the range is not good, enclosed lots must necessarily be used, and when hogs are judiciously kept, they can be raised to considerable advantage. Sties are never used with us for stock hogs.

IX. Dairy Management and Products.

No particular attention is paid to the production of milk, butter, and cheese as a business, for sale. Butter is sent to market during a good portion of the year in considerable quantities. Cheese is not made at all.

X. Manures.

1. Nearly all of the manure made on the farm is derived from the cattle-yard during winter, the stables and hog-pens; stable manure and hog-pen manure are considered nearly equal in value, and both considerably superior to that made in the cattle-yard. The general method of making these supplies of manures, is by keeping the stable and hog and cow-pens littered with straw, stalks, leaves, &c.

2. Straw is frequently applied to land with very beneficial effects, when spread fresh and permitted to lie on the ground,—and shade it for some time previous to its being ploughed in. A good many farmers consider this the most judicious mode of using straw and such like material. Oak leaves, when used in the same manner, are considered beneficial, though not so much so as straw, being likely to be blown away by winds, unless ploughed in immediately.

3. Swamp or marsh mud might be applied in sections of country bordering on streams, but as yet, it has been used to a very limited extent. It has proven satisfactory wherever it has been tried. The chief reason why it is not more used is, that during the summer months and early fall, when it should be dug out and left to dry and pulverize, the tobacco crop allows no time for attending to it.

4. No marl nor fossil shells exist in the county.

5. Lime, the great regenerator of Tide-water Virginia, has been frequently used in the way of experiment, applied directly and simply to the soil. It is mostly used in compost with vegetable materials, such as leaves, &c., and by some considered in this way to be valuable, by others of doubtful utility. Where lime has proven most beneficial, the soil is generally light and sandy. On stiff red land it has, so far as the writer is apprised, proven totally ineffectual. The question at last is not very important to us as we are now situated so far as practical utility is involved, for the high price it would cost when delivered on our farms would prove an effectual barrier to its general use as a fertilizer.

6. No lime in any form is found in the county.

7. Wood ashes have been used from time immemorial, and are justly considered to be one of the most valuable manures. This manure acts finely on all crops, and is particularly beneficial on red stiff land, when applied for tobacco and clover. No coal ashes are known to be used.

8. Bone-dust has been used frequently, by way of experiment, but not with that success claimed for it in some sections. No efforts are made generally to save materials for it, and it is one of the most costly of bought fertilizers. Mexican guano, said to contain a large per centage of phosphate of lime, has been frequently used, but so far with results not so favourable as are generally gotten from Peruvian guano.

9. Gypsum, or plaster, has been used for many years to a limited extent by our farmers. In some isolated cases it is said to act with uncommon effect on clover; but as a general thing, it is not more beneficial than lime.

10. Guano is used to a great extent in this county, and its success has been such that the demand for it has doubled annually. The most common application is for wheat when seeded. The quantity to the acre from 150 to 200 pounds, and turned in with the single turning plough. Some harrow it in and consider this method as equally beneficial. It shows to greatest advantage when applied to old-field land, which has been lying out for a long time. On such land it is generally remunerative. It is not relied on for securing a good crop of clover. In late years, it has been much used as manure for tobacco, with results highly favourable in most instances. Many intelligent planters think it pays as well, (if not better,) on this crop than on wheat. On corn and oats its beneficial action is not so general, and is dependent very much on the season.

11, 12. No earths containing neutral salts or fertilizing materials are found in the county.

13. Many farmers practise a system of composting.

The most general plan is this: First a layer of leaves or straw; next, stable or other manure; next, rich earth, then slaked lime. This succession is followed until the pile gets to be about three or four feet high. The pile is suffered to remain until wanted, and is then spread and ploughed in.

The practice of composting is not so common as it has been.

XI. Orchards and their Products, Vineyards, Vegetable Gardens, &c.

These are kept and cultivated almost entirely for supplying articles for home consumption. The soil is naturally well adapted to the raising of fruits and vegetables, and with a fair and steady market, large quantities might be supplied.

XII. Woodland.

1. The most common growth in the main body of the county is oak, (red, spanish and white,) hickory, pine and poplar. These are generally found mixed in a variable proportion. On the bottom land, walnut, ash, sweetgum and maple are found. Worn-out land, when suffered to lie out, generally puts up in a thick growth of pine, which grows with great rapidity. When this is cut down, the land produces very well for a few years and is easily improved.

2. Timber is principally used for house-building and fencing. Of good building timber there is only a small supply.

3. It would be very difficult to estimate what would be a proper proportion of woodland to leave standing for enclosing, on farms, differing as they do in size. For a small farm judiciously divided into shifts, it would take a much larger proportion of woodland for fencing than would be necessary for a large farm similarly divided. Not more than one-fourth of a farm would be requisite on an average.

4. More than is absolutely necessary for the necessary enclosing on the farm should not be kept, for reasons stated at further length in the address hereto appended.

XII. Old and Bad Practices, and New or Recently Introduced Processes, or Improved Practices in Agriculture.

Of old and bad practices in agriculture, in this county, as well as in Virginia at large, there are, unfortunately, too many. Systems as well as practices have been defective. That system, or practice, formerly so common of wealthy landholders, giving the entire management of their farms and negroes into the hands of improvident overseers, who felt only a temporary interest in their improvement and productiveness, was the fruitful source of our worn-out fields and gullied hill-sides. This practice has, in a measure, wrought its own cure. There are few very wealthy proprietors, and there is little virgin growth to clear. The shallow and imperfect mode of preparation formerly so prevalent, has given place in a great measure to deeper ploughing, and filling up gullies and dressing galls are now the yearly employment of most farmers. The rich bottoms, which were formerly left to the bramble, are now being cleared up and drained. The manure, which was formerly suffered to waste, is now more carefully saved. The system of cultivating the better parts of the farm every year, thus reducing all to a common level in sterility, is superseded by extended rotation of crops, and the growing of clover and the grasses. The improvement of the land is the aim of the mass of the farmers, and, as a consequence, landed property has increased in value at a rapid rate. By the aid of guano, waste-lands, which once were eyesores, are becoming profitable, and are gradually putting on a livery of green.

XIV. Notices, or Suggestions of New or Neglected Resources for Agricultural Improvement.

We consider deep and thorough ploughing and a more extended rotation of crops, as the chief basis of the improvement of land. A gradual reduction of the tobacco crop and a substitution of hay and grain in its stead, would also be advisable. Thorough draining of a great quantity of high land would also be advantageous.

XV. Obstacles to Agricultural Improvement and Profit.

1. No natural obstacles to agricultural improvement exist, so far as known, in this county, more than is common to Piedmont Virginia.

2. The greatest obstacles here, as elsewhere in Virginia, is the need of a proper system of enclosure, already referred to.

3. One other great obstacle is found to exist in the landholders themselves. Owning, as they do, large slave property, and blessed with a competency *per capita* greater than any population in this or any Atlantic State, and thus wanting the grand incentive of *necessity*, there has never been that spirit of enterprise and industry which has rendered far less favoured regions more prosperous. "Eat, drink, and be merry," has been the practice of too many, and luxury and ease have proven the precursors of poverty. Want of personal and constant attention on the part of land and slaveholders to their property, has rendered it unproductive, and thus induced a spirit of dissatisfaction, which has led to emigration. Thus, for many years the annual loss of population and property was immense. This tide of emigration is now stayed, and the labouring class, which has been decimated in one year, is now increasing. With increased produc-

tiveness, the farming profession has regained some of its lost respectability in the eyes of the young and aspiring, and the learned professions, as they are called, do not now absorb all of the talent of each rising generation.

XVI. Unhealthiness of Residents, Caused by Climate and Condition of the Country and its Agriculture.

1. The general healthfulness of the resident of this county, according to the *census*, compares very favourably with the surrounding counties. One and a half per cent. only die annually. This is due, in all probability, to the few causes which exist for the creation of malarious diseases. The streams in the county are rapid, and their inundations seldom destroy crops and vegetation. Mill-ponds are not common. The most frequent source of disease among negroes, is the want of well ventilated cabins, free from dampness and filth.

2. Malarious diseases are far less common now than they were a few years back. The causes of this change are involved in doubt. From 1844 to 1848, fever and ague prevailed generally throughout the country. Since the latter year there has been very little of it The disease was not considered very formidable, but it proved very annoying, and generally prevailed to the greatest extent in the busiest seasons of the year.

4. Whitewashing and thoroughly cleansing in the spring of the year the negro cabins, have been very conducive to the health of slaves. The rank and luxuriant growth of vegetation which generally puts up around negro cabins should also be obviated by cultivation, or other means, and old ashes, &c., carefully removed.

XVII. Population.

According to the census, the population of Nottoway county was, in 1850:

Whites, ...	2,234
Slaves, ...	6,050
Free Coloured, ...	153

From which it will appear that for every white inhabitant there are nearly three slaves, a proportion greater than in any county in the State, and greater than in any county in any Atlantic State. Notwithstanding this fact, it is not known that there is any more insubordination among the slaves than in the State generally.

To Edmund Ruffin, Esq.,
Ag'l Comm'r Va. State Ag'l Society.

A smooth sea never made a skilful mariner. Neither do uninterrupted prosperity and success qualify man for usefulness or happiness. The *storms* of adversity, like the storms of the ocean, rouse the faculties and excite the invention, prudence, skill, and fortitude of the voyager.

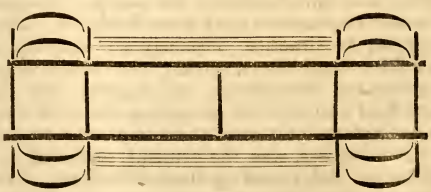
[Communicated to the Virginia State Agricultural Society.]

Description of a Convenient and Economical Frame, or Wagon Body, for Hauling Wheat, Hay, or Straw.

BY W. W. GILMER.

Take two strong, straight white-oak saplings, about five inches in diameter at the but, cut them to twenty feet lengths, and after adjusting the length of the coupling-pole of the wagon to that of the proposed frame, and to the proper distribution of the weight to be carried, place the two long poles on the wagon, within the standards—to determine the proper width of the frame—fasten them at each end by cross-ties four inches in diameter and as long as the axle-trees of the wagon, (the ends of the cross-ties of course projecting equally beyond the bed-poles on each side,) bolt them securely to the runners or bed-poles, with iron or wooden bolts; then take two other cross-ties similar to those above described, and place one of them just behind the fore-wheels and the other before the hind-wheels, so as not to obstruct the wheels, or interfere with the movements of the wagon; then bore holes in the projecting ends of the cross-ties, to serve as sockets in which to fasten the ends of hoops to be made of white-oak, and placed over each wheel, that neither wheat nor hay may come in contact with the wheels when a heavy load is put on the wagon; then take two planks, an inch or inch and a quarter thick, six inches wide, and long enough to extend from one to the outer ends of the inner cross-ties, and fasten them securely at each end to the cross-ties, one at each side of the frame, so as to prevent the load from sinking between the wheels, and to preserve the frame from swagging under the weight of the load. With a wagon thus fixed, twenty bushels of wheat, in the straw, may be packed and carried with ease by a good team over land not too steep. With *two* such wagons, used alternately—attended by two good hands—eight loads may be hauled in a day a distance not exceeding half a mile, if, while one wagon is being unloaded, the team is transferred to the other and returns to the field without unnecessary delay to bring another load.

The following diagram is intended to represent the form of the frame recommended.



[Communicated to the Virginia State Agricultural Society.]

Essay on Clearing Land infested with Sasafras and Briers.

BY W. W. GILMER.

Repeated cropping in corn, wheat, or oats, will but multiply these pests. The best plan to eradicate them, I have found (after many trials) to be mowing them off in the month of May, and subjecting the land to close grazing. A field of mine, in 1850, was, after corn, so thickly set with sasafras and briers, that a friend remarked, that it afforded a good swarth nearly all over. It was sown in wheat and grass in the Spring, and was afterwards grazed for four years to the utmost limit of its capability; the bushes and briers were mowed but once, and to my great delight, the entire field had not left upon it a brier or bush, except where a sasafras tree had been grubbed up. Grubbing a thick-set field is a very costly operation, and will not cure the evil. The idea prevails in the Valley of Virginia, that our lands on this side of the mountains are far more liable to such pests than theirs. The reason for this impression is obviously not in the greater liability of our lands to be so infested, but in the different modes of treating them which prevail in these localities respectively. Their lands are set in grass when fresh, and mowed and grazed from the year they are cleared, by which means these pests are kept under, whilst ours have been generally worked as long as they would pay, and in many instances much longer, and not grazed, because we had but little stock, and were only mowed to a very limited extent; on which account the evil complained of has not been checked by the remedial process I have suggested.

Let me not, however, be misunderstood on this subject. The mowing recommended refers only to the bushes and briers. He who has an abundant supply of corn-stalks, shucks, wheat-straw and chaff, has no need of hay for stock of any kind. If near to market, and hay can be sold for one dollar *cash*, then mow it; but if at a distance from market, and the staple crops are corn and wheat, *mow not.* It is my decided opinion that the cutting of a crop of clover-hay, and the taking away of the seed, will exhaust land as much as a crop of corn. Rich flats will stand it, but common high land cannot.

The question may be asked, why graze if so much opposed to hay-making? Because *cash payments* are made to the land in grazing it, whilst but little is returned to it when hay is cut and fed on the farm, and nothing when it is sold off. Again, the grazing process proceeds slowly and but gradually despoils the land of its covering, while mowing leaves it suddenly denuded and exposed to the blazing Summer's sun. I keep as fat horses and oxen as most persons, yet I have not, on a farm peculiarly adapted to the business, cut five tons of hay within the space of twenty years. Let those who have rich moist flats, institute careful experiments to test the relative value of their prodution in corn and in hay. It will be found that the corn will give at lest fifty bushels of grain per acre, while the rough food from that acre will amount to *at least* as much in quantity, and be fully equal in quality to hay so far as it is eaten. The difference, then, in favor of the corn crop, will be the nett gain of the amount of *grain* produced, the *offal* of the crop being fully equal in value to the production of the same quantity of land in hay.

For the Planter.

From the Papers of the Nottoway Farmers' Club.

Best Mode of Applying Manures to the Soil.

Mr. President:

In obedience to the requirements of this Club, I offer as an annual contribution, a few thoughts on what may be considered the best mode of applying manures to the soil. I mean, such manures as are usually made from stable, farm pens and otherwise. A subject of paramount importance and of such practical utility to agriculturists, requires serious consideration.—An abundant supply, properly applied, superseding almost any rotation of crops, being as it were the sheet anchor of the farmers' hope, a lever with which he can reinvigorate his exhausted lands, and make them equal, if not superior, in productiveness to the California placers. As however, this is the great resource and desideratum of profitable culture, it becomes necessary to use what little we have cautiously and so judiciously apply it to the surface, as to obtain the greatest possible benefit. There seems to be much diversity of opinion as to the proper depth of burying it; some are inclined to think that it sinks in the soil and is washed down by the percolating rains, and should consequently be applied on the surface or just beneath it, whilst others affirm that its volatile and most valuable parts ascend, by a chemical process, which renders it necessary that it should be covered deep in the earth. If it is true, and I do not mean to question it, that manure remains very nearly where it is placed—if sunk in the earth deep it remains deep, and if near the surface, there also it remains, it is very clear it is immaterial whether it is applied shallow or deep, as either way may answer, for I have uniformly seen the same beneficial effects when applied to the surface or otherwise buried deep; and I have also observed the soils which forms the bottom of manure heaps even within a few inches of the surface does not seem to be enriched by the collection of fertilizing matter which rested uponit.

When it is taken into view that clay usu-

ally possesses the power of absorbing the fertilizing properties of manure, it seems evident that soils which have the same degree of tenacity with a medium amount of loam will derive all that is valuable from common manure, and that the great art in its application is, that it should be in sufficient quantity and intimately mixed with the soil through all of its parts, in order that vegetation may obtain its full benefit, and not to be made too luxuriant at one part, whilst another part may perish for want of nutrition. Respectfully submitted,

HENRY E. SHORE.

GOOSEBERRY MILDEW.

It is well known that mildew is so destructive to gooseberries in this country, that but few of the large and choice kinds ever perfect much of their fruit, and as a consequence, one of the nicest of fruits is but little seen in our market, in a ripe state. The writer of the Calendar for the Horticulturist, gives a very simple remedy, which if as good as represented, is well worthy of extensive application. The following is the remedy, and as we read it, merely requires the application once, "when the fruit is forming:"

Mildew may be prevented, by watering with soap suds, over the branches. A radical cure for this pest may be formed by mixing a peck of lime and a pound of sulphur, in ten gallons of water; let it stand and settle. A pint, in 4 gallons water, syringed over the bushes when the fruit is forming, will keep them clean; cover the ground with manure, and spread a small quantity of salt over it, to keep as much moisture as possible about the roots.

Mulching is undoubtedly a good thing, as it keeps the roots in a more uniform state as regards heat and moisture, and salt is recommended by several different writers just at this time. Our experience goes to prove that if planted under the shade of trees somewhat, they escape mildew, although the fruit is small. The fine show varieties of England are much more subject to it than the small rough kinds. The Whitesmith and Houghton, are perhaps the safest to plant.

Country Gentleman.

Tomatoes.

A correspondent of the *Genesee Farmer* gives his modes of growing tomatoes. He forwards his plants in a hot bed or green house, and grows them in pots until they are a foot or a foot and a half high, turning them out about the second week in May. He plants them three feet apart in rows. When planted he drives down a few stakes, six or eight feet apart, leaving them about four feet high the whole length of the rows, and nailing a strip of wood all along the tops, and tying one or two lower down the stakes, to make a trellis. The ground should be dug deep and made rich with manure, and a spoonful of guano mixed with the soil around each root. We quote:

"When they have grown sufficiently long to tie to the trellis, I select two or three of the longest shoots and tie them loosely to the trellis cutting away all other small laterals which may grow on the main branches. I let these main branches grow until they have come in flower and set the first bunch of fruit; then I pinch out the top, one joint above the fruit, leaving the leaf entire. I then allow it to go on again until it has flowered and set another bunch of fruit, when the top is pinched out one leaf above the bunch, the same as the first, and so on of all the rest, taking care to cut all the laterals which may grow on the main branches down to the axles of the leaves, as often as they are produced, but leaving the leaves entire. If any one will take this little extra trouble, he will be amply repaid and absolutely astonished at the immense clusters of fine large tomatoes he will have. If planted in a favorable situation they will ripen at least as early as those grown in any other way out of doors, and frequently three days or a week earlier. When ripe they will hang longer on the vines without decaying. The situation can hardly be too sunny. Deep, light, loamy soil suits them best."

The Poetry of the Asparagus.

The delicate Asparagus, with its pretty Greek name (*Asparagos*, a young shoot not yet opened into leaf.) Is there not much beauty in a bed of asparagus run to seed? The tall, slender, feathery, green sprays, with their shining, bead-like berries, have an air of great elegance, especially when begemmed by the morning dew. Asparagus was first cultivated in England about 1662. Some species of the wild asparagus are still found in Wales, in the Isle of Portland, and near Bristol. Tavernier mentions having found some enormous asparagus on the banks of the Euphrates; and Pliny mentions asparagus cultivated at Ravena, three of which would weigh a pound.

Asparagus is an especial favorite with our Gallic neighbors. Of the French philosopher, Fontenelle, an anecdote is related, which shows how completely his *gourmandize* could conquer all natural emotions of the mind!

One day a brother literati, with whom he had lived in habits of friendship for many years, came to dine with him. The principal part of the meal was to consist of asparagus, of which

both host and guest were extremely fond, but they differed in their taste as to the mode of dressing it; the latter preferred it with butter, the former with oil. After some discussion, they came to a compromise; the cook was ordered to make two equal divisions, and to dress one share with oil, and the other with butter. This knotty point being settled, the friends entered into some literary conversation. In the height of their discourse, the guest fell from his chair, suddenly struck with apoplexy.—Fontenelle hastily summoned all necessary assistance, but in vain; for, despite of every exertion to restore him, the invalid expired. What were the reflections of our French philosopher on this abrupt and melancholy termination of a long-standing friendship? Awe? Sorrow? Religious aspirations? No! but a happy recollection that now his own taste could be fully gratified, without the necessity of any deference to that of another. He left the corpse, and, running to the head of the stairs, called out to his cook—"Dress it all with oil—all with oil!" "*Tout a l' huile—tout a l' huile!*" It is not surprising that a man so exempt from the wear and tear of human emotions as Fontenelle, lived to be upwards of ninety-nine years of age. He was for forty years Secretary of the Academy of Sciences, and died in 1756.

Wild asparagus was held in reverence by the Ioxides, a colony in Caria, in remembrance of their ancestress, Perigone. She was the daughter of Sinnis, a robber of gigantic stature, dwelling in the Peloponnesus, who was surnamed the Pine-bender, from the species of cruelty he practice on all whom he defeated.—He used to bend down two pines till they met; then he tied a leg and an arm of the captive to each tree, and suddenly letting the pines fly back to their natural position, the unfortunate victim was torn asunder. This monster was conquered by Theseus, and put to death in his own manner. On his defeat, his young daughter, Perigone, fled and hid herself amid a brake of wild asparagus, praying the plants, in childish simplicity, to conceal her, and promising never to root them up, or burn them. She lay among them so well sheltered, that she escaped discovery by Theseus, till she was induced by the conciliatory tones in which he called upon her in his researches, to come forward to him. He subsequently married her, and their grandson, Ioxus, founded in Caria a colony who kept in memory a pledge of Perigone to the plants that had given her refuge.

The wild asparagus being full of prickles, yet agreeable and wholesome to eat, its sprays were used by the Bœotians as wedding garlands, to signify to the bride, that as she had given her lover trouble in wooing her, so she ought to recompense him by the pleasantness of her manners in wedded life.—*Dublin University Magazine.*

Soap Suds for Currant Bushes.

A correspondent of the *Indiana Farmer* says: "I have found the cultivation of currants to be very profitable. By care and attention I greatly increased the size of the bushes and the quality of the fruit. My bushes are now about six or eight feet in height, and are remarkably thrifty. The cause of this large growth, I attribute in a great measure to the fact that I have been in the habit of pouring soap suds and chamber lye around their roots during the summer season. I am satisfied from my own experience and that of some of my neighbors, that this treatment will produce a most astonishing effect upon the growth and product of the bushes, and would advise others to give it a trial."—*Ohio Valley Farmer.*

The Randall Grass.

A species of grass was discovered more than 30 years ago on Doe Creek, a tributary of New River, in Giles county, by an old man named Randal Lucas. As the seed differed from that of all other native grasses, he cultivated it for years, selling the seed by the pint, at a high price. By such means, this grass was disseminated in Southern and Western Virginia, and is prized as highly as the Herd's grass (Timothy) and orchard grass.

The Randall grass may be sown with wheat in the fall, or with oats in the spring, at the rate of a bushel to the acre. It will also do well on fresh, new land which has never been plowed. As a forage plant, it is more valued for pasture than for hay, being one of the earliest grasses of the spring, and latest of the fall. The second summer after sowing, it may be mown, and the seed saved, which matures early in July. It usually grows to 18 or 20 inches in height.

WM. EGLISTON, Virginia.

Patent Office Report.]

CHINESE SUGAR CANE.—Doubts have been entertained whether this cane will make sugar in the climate of the United States; but the Washington Globe says it has seen numerous specimens of apparently good sugar made from it. It adds, that experienced cultivators of it assert that the syrup is a profitable crop at 25 cents a gallon; and that, even if neither sugar nor syrup could be obtained from this plant, it would still always prove an advantageous forage crop.

From the British Farmers' Magazine.

Lecture on Artificial Manures.

BY PROFESSOR VOELCKER.

A meeting of the members of the Wenlock Farmers' Club was held at the Raven Inn, on Monday, Dec. 21, to hear a lecture on the "Agricultural and Commercial Value of Artificial Manures," by Dr. Augustus Voelcker.

Dr. VOELCKER commenced by observing that there are two classes of persons who, upon the subject of the utility of agricultural chemistry, entertain diametrically opposed opinions. One of them think nothing more is necessary for successful farming than to read one or two books upon agricultural chemistry, and perhaps Mr. Mechi's letters, or some similar popular treatise, containing a strange admixture of science and practice; and this kind of knowledge they believe will enable a man to dispense with that vast amount of experience which every one who has tried his hand at farming knows is requisite, no matter how clever a man be, if he would make a living by farming; while the other class think that agricultural chemistry, like all other sciences, is, to use a plain word, all "humbug." The truth here, as in many other things, lies in the middle. A mere knowledge of science will never make a man a good farmer; but at the same time, it is of very great advantage if, in addition to practical experience, he has a knowledge of the principles of science. Moreover, young men with a scientific knowledge would make much greater progress in useful experience than others who were ignorant of the principles of chemistry. The great utility of science to farming is not so much direct as indirect—it does not dispense with that practice, without which no excellency could be acquired, but enables the farmer to make better use of it. Very frequently, in lectures of that description, the mistake was made of aiming at too much—a large number of subjects were mixed up together, and the audience went away more or less muddled. It was also not unfrequently thought that in order to make an impression a little exaggeration was necessary. The very fact, however, that this club had existed, and kept up with spirit for a number of years, was a sufficient reason, if he had no other, why he should not attempt in this way to create a little temporary excitement. He should confine himself to one very important subject—that of artificial manures, and attempt to convey some views on the subject, which he trusted would be of some use in their practice as farmers, (Hear, hear.) There could be no question as to the great improvements which have taken place since artificial manures have been introduced into farming. The great demand for artificial manures is the best proof that in many instances they have not been misapplied, for no man will spend money for a succession of years upon something which brings him no useful result. The fact, therefore, that new companies and new businesses are started almost everywhere, proves that artificial manures when judiciously applied, are a great boon to the agricultural community. Within the last three or four years manufacturers of artificial manures have sprung up like mushrooms, and it was therefore not to be wondered at that some inferior descriptions have been offered to the notice of the farmer. It must also not be forgotten that in many instances artificial manures have proved complete failures. The question, therefore, arose, What is the reason of these failures? It was not always easy to discover the reason. In some cases artificial manures have been injudiciously applied; *i. e.*, in too large or too small quantities. He had seen guano used in quantities that would certainly do more harm than good—too large, that was, for the soils or crops to which it was applied, to the exclusion of farm-yard manure and other manures more suited for root crops. In passing, he observed that guano should not be used generally upon any soils for crops dependent upon the development of the roots. For turnips, mangolds, and other root crops, the manure should have a large proportion of bone material—phosphates, as the chemists call them. In some cases again, the failure must be attributed to the artificial manure which has been supplied; and he grieved to say that in the present day there was a much larger number of inferior than superior kinds of manures sold. The diagrams would show the analyses of different kinds of manure. One of them was the London Economical, which at one time made a great noise, and was used in different parts of England and Scotland. It was accompanied by a small volume of testimonials, all speaking of it as a most efficient manure; whereas it contained nothing which was known as possessing fertilizing properties in a very high degree. If any good effect had therefore been produced by its application, it must be attributed rather to the good farming, or to an uncommonly good season, which, as was well known, often was more effective than the best manure, (Hear, hear.) And indeed it was almost impossible by experiments, continued even for two or three seasons, to ascertain the practical value of a manure; but in the long run a really good manure will be found out. He remembered the time when there were almost as many people against guano as there were now for it. Not very long ago hardly any purchaser for bones could be found; and even now no bones were used on the continent, hence the large importations of that article to this country. Everybody knew that artificial manures were more efficacious under some circumstances than others; and why? Because the effect produced by artificial manures would be just in proportion as it supplied the ingredients which were deficient in the soil.

Artificial manures sometimes failed, too, by reason of the mechanical condition of the land being such that it could not produce its legitimate results. For instance, fresh bone-dust does not act upon the soil at all for the first year, very little the second, and only a partial effect the third. For want of sufficient air the material remains very much in the condition after the first six or twelve months in which it is put in. Excess of moisture was often another reason why manures were unproductive. Without good drai ing no amount of artificial or natural manure would produce a very large crop. It would be seen, then, that the practical efficacy of artificial manures is known by a variety of circumstances; and it would also be clear that the commercial value of artificial manure does not necessarily coincide with its practical efficacy—the commercial value of artificial manure being much more fixed in its character than the practical value. For instance, under some circumstances lime produced an astonishing effect upon the land; in other cases none whatever. In the neighbourhood of Cirencester no good farmer limes; and upon examination the soils are found to contain sufficient lime to meet the requirements of the growing crop. In the generality of cases, however, the soil does not partake of the character of the subjacent rock—most of our soils being soils of transportation, and do not belong exactly to the rock on which they rest. Hence a general geological knowledge will not be a sufficient practical guide—nothing short of an examination of the surface will decide when a man should lime and when not. The practical efficiency of artificial manure is determined by experience, and does not necessarily coincide with the price at which it is bought in the market, but on its particular adaptation to the land where it is applied. In most soils phosphoric acid was deficient, and hence really effective manures contained a very considerable proportion of phosphates. Again, in some descriptions of produce—corn, &c.,—ammoniacal matter was of very great utility, because ammoniacal ingredients were generally deficient in the soil. It was also found that alkaline matter, potash and soda, produced very great effects when applied to the land. This was the conclusion, then, to which they must arrive: phosphates, and substances which, on decomposition, are ready-formed ammonia; substances containing nitrogen; and alkaline matters, more especially potash, are the most universally efficient manures. These are also the more expensive manuring constituents, so that to some extent the practical and commercial value of artificial manure go hand-in-hand; but, on the other hand, it would be wrong always to determine what you should pay for artificial manure by the effect which it produces. In some cases he had seen super-phosphates applied upon land which contained in themselves a large quantity of phosphates, and therefore the extra supply did no good whatever. These, however, were exceptional cases, and did not often occur. The question—and a very important one it was—then arose: what description of manure ought you to use? and secondly, what ought you to pay for a manure of a certain character? No person should understand so well as the farmer himself what is really required for his particular farm; and in practical matters no fixed rule can be laid down. Some general hints may be thrown out which have been collected from a number of experiences in various districts, which are useful as a basis; and it is from the experience of farmers living in many counties in England and Scotland we know that, generally speaking, ammoniacal or nitrogenous matters are peculiarly beneficial to corn crops. In making this statement, he left entirely untouched the question whether mineral substances are not an advantage in some instances for corn. He knew that they were. But, on the whole, substances rich in nitrogen are applied with great benefit to corn crops. Hence good rotten dung was better than fresh manure, because weight for weight it contained a larger amount of nitrogen. He wished them to understand that he did not recommend well-rotted dung under all circumstances; because it was generally better to take the manure as fresh as possible, and get all that was valuable out of it upon the land. But because rotten manure contained a larger amount of nitrogen in the shape of ammoniacal salt, it generally produced greater effects than the fresh. So with guano—a small quantity of this produced such extraordinary results, because it contained in one cwt. as much ammonia as a ton of well-rotted farm-yard manure. The effect of manures did not depend upon anything mysterious. Manure from half-starved animals would never be very good, no matter how much it was turned, and it was not the mere rotting that made it good. In good Peruvian guano there was from 16 to 17 per cent. of ammonia. It was important that they should recollect that there was a great difference between good Peruvian guano and that which had been brought over since the best layers had been cleared away. In good guano there was also a large proportion of phosphates or bone earth. The solid part of bones consists of phosphoric acid and lime, and this would explain why it is that good guano produces a good effect upon turnips. Experience had likewise shown that phosphoric manures were especially beneficial to root crops—bone dust and some inferior kinds of guano, having phosphates of lime as their characteristic constituents, were the manures best adapted to turnips, mangolds, *et cetera*. Alkaline salts was a very good manure for root crops. It would be admitted by all who had any experience in the application of artificial manures, that guano and superphos-

phate were the two most valuable, in a commercial point of view, that could possibly be used in agriculture. Guano, it was well known, was the most successful agency they could apply to wheat or grain and grass lands, while superphosphate was most applicable to roots. Saldanha guano, which was cheaper than the best Peruvian, produced a better result when applied to roots, because it contained more phosphate. If they depended entirely upon guano they would have too much leaf and not sufficient bulk. A series of experiments which he had continued for four years convinced him that they could not dispense entirely with ammonia for root crops, but it produced frequently more harm than good. To spend, therefore, a large sum in buying ammonia (which is a very expensive material) for root crops was to make a great practical blunder; for phosphate was one-seventh the cost, and produced infinitely better results when applied to roots. Commercially speaking, ammonia is the most expensive ingredient used in superphosphates. Alkaline salts, which are occasionally found in artificial manures, are likewise expensive materials—too expensive, in fact, to be used with advantage in agriculture. For this reason most artificial manures do not contain any appreciable quantity of these expensive salts—the effect they produce upon the land is not commensurate with their cost. Bearing in mind, then, that the value of artificial manures is to be estimated by the amount of nitrogen (ammonia) and phosphates which they contain, there would be no difficulty in applying this test to the different manures sold to farmers. The Economic Manure, to which he had referred, contained very little of these ingredients. A sample of Mexican guano (as would be seen from the diagram) contained only 18 per cent. of phosphate of lime (one-third of that contained in bone dust) and a mere trace of ammonia. Another manure, advertised as the very essence of Peruvian guano, consisted chiefly of burnt clay, carbonate of lime, and a little sheep's dung. (Laughter.) The learned professor then directed attention to the diagrams showing the composition of the best guano (for corn) and the best superphosphates for root crops. These manures varied considerably in their component parts, and their effect when applied to the land must also be vastly different. In one of the samples it would be seen that there was not more than a fourth as much phosphate as that contained in another sample. In the highest there was no less than 40 per cent. of soluble and insoluble phosphates, and this could not be sold for less than £12 per ton. With this exception the other manures—though varying so much in quality—were about the same price, from £6 to £7 10s. How could you ascertain which really was the most valuable article? To take it up, and smell it, in order to discover its quality, was simply ridiculous. In the course of the year he examined some hundred specimens of superphosphates; yet he had not yet attained to that practical acquaintance with it to be able by looking at it to ascertain whether it was good or bad. They all looked very much alike, and smelled more or less disagreeable. In nine cases out of ten, as he had said, the farmer wants either guano or superphosphate, and he should confine himself to these manures. As to guano, when farmers buy this they ought to receive in writing a guarantee that it really is genuine Peruvian with which they are supplied. But if there is any suspicion, a very simple test would prove whether it is well grounded or not. A trustworthy opinion of its genuineness could be obtained at the moderate expense of seven or eight shillings. Without this, however, good Peruvian guano has such marked qualities, and varies so little in its composition, that any one may for himself ascertain its quality. When burned it should leave one-third of itself a perfectly white ash—adulterated guano produces more ash, and is coloured; this ash, on being dissolved in acid, should leave no perceptible amount of sand. At any rate, it would be easy to obtain in writing from the dealer a guarantee that what he supplied is genuine. Superphosphate is a manure that can be produced in a variety of ways, its efficacy depending, unlike that of guano, on the amount of phosphate it contains; and not only upon the amount of material, but upon the state of preparation it has undergone. Between soluble and insoluble phosphates there was a great difference, not only in their efficacy, but in the expense to which the manufacturer is at to produce them. Manuring constituents to enter into plants must become soluble; phosphates, when in a condition to be readily taken up by plants, must be far more efficacious than the same constituents in a state in which they cannot be absorbed by the rootlets. To illustrate this, a valuable raw material was coprolite, or fossil remains, which had been not altogether correctly termed coprolites. That term signified the petrified excrement of animals; but the substances known as coprolites were in reality the fossil bones of those animals which in distant ages inhabited the regions where they were found. They were also more correctly known by the name of pseudo-croprolites, and were in reality nothing more than fossil bones. With regard to their composition he might observe that they did not contain any organic matter; they contained only mineral substances, and amongst others phosphate of lime. In its crude state, however, this phosphate was of no use whatever; it produced no effect, no matter how finely it was powdered. He had tried it repeatedly, some eight years ago; and, although finely powdered, it remained insoluble, even when attacked by acetic acid. Hence there

was always some risk of having a portion of insoluble and useless material in superphosphates. Bones were rendered only soluble by expending large sums of money in buying expensive acids; hence soluble bone earth is worth at least three times as much as it is in its crude state as insoluble phosphate. It may be asked if, when these acids came into contact with the tender fibre of the plant, would they not be injurious to it? There was, however, in most soils a natural provision against this; there was generated in the soil lime, or oxide of iron, or alumina, or some other constituent, which neutralized any such effect. Even oil of vitriol was soon dispersed and neutralized by these constituents. When applied to land, therefore, the superphosphate became insoluble. Hence it did not enter into the composition of the plant as applied. But they would be inclined to ask what was the value of the manure if it did not enter into the composition of the plant immediately on its application? To this he would reply that the great value of superphosphate was owing to its sub-division, for in its finely divided condition it possessed properties differing very materially from ordinary insoluble phosphate of lime. The lecturer took a solution of bone dissolved in acid, to which he added ammonia. The result was, that the whole of the phosphate was rendered soluble, the solution appearing to be converted into a thick glutinous mass. In this finely divided state, it was easily taken up by the plant. This he illustrated by adding to the precipitated phosphate some strong vinegar (acetic acid,) when the whole was instantly dissolved, although this comparatively weak acid would scarcely have had any action on bone dust, if applied in the first instance; thus showing that by resorting to this mode they obtained the advantage of more energetic action. Pounded or ground bones could never be divided into such fine particles, or spread so equally or evenly over the soil, as could be accomplished when dissolved in the manner he had described; and their bulk greatly increased, for the one was mechanical action and the other was chemical. When bones were used first it was usual to break them into one-inch pieces; when they became dearer they were reduced to one-half the size, for the farmer discovered that when more uniformly spread half the quantity was just as good. And so in the application of artificial manures—it was everything to have it, not here and there, but well distributed, so that the roots of the plant could reach it, and take up the ingredients congenial to its growth. Some persons contended that it was an advantage to have a portion of the phosphate insoluble, in order that it may remain after the rain had washed away the soluble portion, to maintain the after-growth of the plant. This was all moonshine and theory, and never could have been founded on practice or correct principles. It was certainly a most convenient doctrine for artificial manure manufacturers to say that it was as well, and better, to have a portion insoluble, because the more soluble the phosphate was the more expensive it was. The conclusion, therefore, to which he would lead them, was this: In buying superphosphate, let them ascertain that they had a large proportion of soluble phosphates. There was no reason why the farmer should go to the expense of an analysis; let the dealer supply one; it was his business to show what he had to sell. If a dealer had an objection, and said, "My manure is as good as anybody else's, but I cannot tell you exactly how much soluble phosphate there is in it," they may be sure that in nine cases out of ten he had not a very good article to show. In the absence of an analysis, the dealer should be required to give a guarantee that it contained so much of soluble phosphate; for upon this the value of the manure chiefly depends, and not only upon the amount of its various constituents; analyzation, therefore, was not always a sufficient test of the full value of a manure, although of course the material must be present to have a really efficacious manure. He was most anxious to point out how desirable it was that the farmer should not be content to buy his superphosphate, relying entirely upon the respectability of the dealer. Frequently the dealer may be a very honest man, and yet may not know himself what he is selling; the manufacturer himself may be a perfectly trustworthy man, but he may have some very erroneous notions as to the relative value of soluble and insoluble phosphate; and such ideas may not enable him to produce so cheaply an effective manure as another manufacturer. The farmer is not to pay for the character of the dealer or the manufacturer, but for the character of the manure, (Hear, hear.) The cheaper he could get it the better, but by all means secure a guarantee. These few practical hints he hoped would be of advantage to them in purchasing artificial manure. It was only by these means they could check the nefarious practices which now and then are attempted upon the farmer. The adulteration of guano had been practised last year to a far greater extent than he had ever known it before—as many as three-fourths of the samples he had received were adulterated; on the other hand, superphosphates appeared to be getting more valuable, and this he attributed to the general demand which was now made for guarantees. After thanking them for their attention, the learned professor resumed his seat loudly cheered.

DR. VOELCKER ON THE COMPARATIVE VALUE OF ARTIFICIAL AND FARM-YARD MANURES.

On Tuesday Professor Voelcker delivered a

lecture on the above subject, in the Lion Rooms, Shrewsbury. Mr. Joseph Meire, of Berrington, presided.

The attendance was not large.

The CHAIRMAN said the subject upon which they were about to hear a very interesting lecture was a very important one to the farmer.

Dr. VOELCKER said there had been a good deal of talk about the relative merits of farm-yard manure and artificials. Some would have nothing but the former, while others evidently thought the perfection of good farming was to use an unlimited quantity of artificial manure. Many of the latter gentlemen troubled themselves very little about what they really bought; it sufficed for them to expend a certain amount of money on some description of artificial manure, which might be entirely valueless for their particular purpose. Such, for instance, as the London Economic, the Essence of Guano, and others. Now, farm-yard manure was an excellent thing in its proper place, and so was any other description of manure. Some artificial manures, which were exceedingly valuable, lost their efficacy from being improperly applied, and a great quantity of valuable manure at the present day was wasted on farms for the want of knowledge necessary for its application. Those who had not sufficient intelligence or general knowledge on the subject of plants would be less likely to go wrong if they followed the old-fashioned routine and used farm-yard manure, than by using artificial manure, which at least would be of no use to them. Some knowledge ought to be had of the wants of the different crops that grow in rotation. Those wants could not well be laid before his hearers without a reference to the character and properties of the soil to which they were applied. On the whole, the proper system of manuring required a great deal of rudimentary knowledge, which could not be treated of in a single lecture. He would therefore rather offer a few remarks on the comparative advantages of natural and artificial manure; and each of these possessed peculiarities of their own, which rendered them perfectly well adapted to special purposes. As would be seen on reference to the diagrams, one peculiarity of farm-yard manure was its extreme complexity of character. [The diagram referred to contained the analysis of the component parts of fresh and rotten manure.] It contained both organic and inorganic food, and was applicable to a variety of crops, such as corn, root crops, and grass land; and this, no doubt, was the reason why farm-yard manure was entitled to the name of universal manure. It contained everything required by our cultivated crops. But he did not say that it should always be used indiscriminately. Another peculiarity of farm-yard manure was that it exercised beneficial effect on plants, not only supplying direct food to them, but producing a highly beneficial mechanical effect on the soil, especially on stiff clay land. He was a strong advocate for long dung being applied as soon as possible. In the yard manure one great peculiarity was the large amount of water—in fact, this amounted generally to 66 per cent., and in rotten it amounted to three-fourths of the whole bulk; so that for every ton of active manuring matter, the farmer has to cart three tons of useless materials, even supposing that the remaining ton is composed of nothing else but valuable fertilizing constituents. This would explain why it was that artificial manures were especially adapted for hilly districts and for fields removed a considerable distance from the farm-yard. He did not think that farmers always took a sufficient account of the wear and tear of horses and men in the transit and application of that manure. If the subject were carefully considered, the farmer would think twice before he carted a heavy load of farm-yard manure some eight or nine miles from a town, and afterwards applied it to a remote field on the farm; and he would also hesitate before producing farm-yard manure at any expense. Under some circumstances, which every farmer ought to know best for himself, feeding cattle did not pay at all; farmers sometimes made up their minds to feed at a loss, calculating on something for the manure. But it was a very delicate question whether this was the best way of producing manure, or whether it was not better to use the ordinarily made manure, and apply it in connection with artificial or special manure, the latter term showing that it was adapted for special purposes. If a farm was not in good order, it ought to be brought round by general manure, such as farm-yard manure; but when it was in better condition, to make it go as far as possible, special manure must be resorted to. A peculiarity in artificial manures was that they supplied special fertilizing ingredients to the exclusion of some others which were abundant in farm-yard manure. For instance: In the best Peruvian guano there was a high percentage of ammonia, with about 20 or 25 per cent. of phosphate of lime; and that guano was applied for getting an additional crop of corn. Some other artificial manures —bone-dust, for instance—were valuable on account of their containing phosphate of lime, which was favourable to the production of roots, nothing tending to the rapid development of bulb so much as that. He did not mean that phosphates were of no use to corn crops. In some soils they produced a marked effect, and he had that morning recommended a gentleman to use superphosphate by way of a trial, to keep up his wheat. There had been a good deal of talk about a deficiency of silica in soils, which prevented corn from standing up. It was remarkable that soils peculiarly liable to corn lying down generally contained

a high per centage of silica. From observations that had been made on the subject, he was inclined to think that what had been said about silica must be regarded more as a theory rather than a resting on well-ascertained facts. It had not yet been ascertained how it was that some crops were stronger than others; and until that was found out, it was of no use reasoning upon the matter. Corn become laid down from a variety of reasons. If the land contained a supply of all the elements necessary for the growth of the plant, a dressing of guano produced a coarse wheat, which often became laid down. When wheat became laid down it arose from something in the soil being in too large proportion. Some people had a curious way of estimating the skill of the farmer by the amount of the manure which he put on his land. Some men were content with eight tons of farm-yard manure, while others used as much as twenty tons to the acre. The former, however, who tried the larger dose did not often repeat the experiment, for he became convinced that, in farming, what was good in one instance was not good in another. The great advantage of artificial manures was that they contained special fertilizing ingredients to the exclusion of other substances, and hence its adaptation to special circumstances. How were these special circumstances to be ascertained? He had no doubt in his own mind that bone-dust or superphosphate mixed with farm-yard manure would be of great advantage, as it would supply the element which was very much deficient in farm-yard manure, especially where the manure was produced by young and lean stock, which absorbed all the phosphate of the food; in the manure from fattening animals there was a large proportion of this substance, and hence its great value. Phosphates, generally speaking, were more suitable for root crops, but it was impossible to lay down general rules; the farmer himself ought to be the best judge, whether in order to obtain a good crop anything else was required. Turnips did not live alone upon phosphate; they required a variety of other substances—lime, soda, potash, and other fertilizing matters. It depended upon the farmer to find this out, and no one else. There was a good deal of land in this part of the country which required nothing more, in order to obtain good root crops, than bone in an efficient state of preparation. The learned professor then went on to observe upon the constituent parts of guano and snperphosphate, and their application to particular soils and for particular crops. [The substance of this part of his lecture will be found in our report of the Wenlock Farmers' Club.] He illustrated the immense importance of examining the manure we buy, by referring to the following table, which proved that some superphosphate contained four times as much valuable fertilizing matters as others:

COMPOSITION OF SUPERPHOSPHATE OF LIME.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
Water,	19.26	20.53	14.40	22.03	20.37	8.91	10.80	26.89
Organic matter,	16.10	14 76	8.93	trace.	25.71	—	4.21	2.08
Soluble phosphate of lime,	6.38	10.31	3.60	8.55	5.02	25.70	20.28	14.78
Equal to bone earth,	(9.94)	(16.09)	(5.61)	(13.33)	(7.37)	(40.11)	(31.63)	(23.06)
Insoluble bone phosphate,	22.16	17.72	6.83	6.83	1 56	6.68	4.11	5.58
Hydrated sulphate of lime (gypsum,)	25.10	28.39	44.20	24.42	40.16	43.05	46.63	43.60
Burnt gypsum,	—	—	—	40.43	—	12.38	—	—
Alkaline salts,	5.16	1.56	2.52	2.41	2.93	.96	10.78	1.18
Sand,	5.82	6.73	19.50	2,16	4.23	2.32	3.19	5.26
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Per-centage of nitrogen,	1.66	.853	1.44	.17	1.11	—	.34	.21
Equal to ammonia,	2.01	1.065	1.75	.20	1.42	—	.41	.25

Mr. George Davies, as a farmer, was much obliged for the able and practical lecture which they had just heard. He wished to know if the learned professor could tell him how red clover could be retained on light soils from February until June. He had some years ago conversed with Dr. Pepper on this subject, and was now in communication with Mr. Nesbit, but the latter gentleman had not answered the question he now put.

Dr. Voelcker said, this question was a most important one, which it would be most desirable to solve. About four years ago, he paid some attention to what was called "clover-sickness," and, like most beginners, in two months he fancied he knew something about the matter, and threw out some suggestions, with a view to remedy the evil. Having, however followed up the question in various operations, and in the laboratory, and after some

long correspondence, he had come to the conclusion that, upon the subject of clover-sickness, he knew as much or as little as the man in the moon.

Mr. Davies asked if the fermentation of ordinary manure would render chipped bones sufficiently soluble to be of use to the crop?

Dr. Voelcker thought it would be quite sufficient; and, after one turning, the bone-dust would disappear. It would, in his opinion, be a very great advantage to use bone-dust in that way.

Mr. Payne inquired if the Professor recommended long manure to be ploughed in, or used as a top-dressing?

Dr. Voelcker said, in very stiff land it would be better to plough it in, as in that way they obtained the full advantage of the manure.

The Chairman, in the course of some observations, asked if the plan recommended for keeping up the wheat was by stiffening the straw? If so, superphosphate would be much more likely to do that than ammonia.

The Professor said he knew, in some instances, that superphosphate stiffened the soil; but that was a different thing from recommending it for the purpose of stiffening the corn. Ammoniacal manures certainly had a tendency to make corn go down, and should, therefore, be used very carefully.

Suggestions About Purchase of Reapers.

We publish from *The Country Gentleman* an account of the Harvesters which contended for premiums in the National Trial, held near Syracuse, N. Y., during the last summer:

If we abstract the valuable features of each machine exhibited at the Syracuse Trial, and fancy them grouped in one Harvester, in this *ideal implement*, we will probably have a standard of a *perfect Reaper and Mower*. We give the result of such an effort, made to the best of our ability, for the benefit of those of our readers who may be interested in this subject.

1st. It is of prime importance that a Harvester should be strong, and to this end, it must be made of the best material, and no principle of mechanical philosophy must be violated in its construction.

2d. It must be of easy draught. In order to this, the machine must be perfectly balanced, laterally and vertically; laterally to prevents ide-draught, vertically to protect the necks of the horses or mules. In this connexion, regard must be had to the seat of the raker, with reference to his safety, to the work he has to do, and to his personal comfort. The line of draught should, as nearly as possible, be at right angles to the collars of the team.

3d. The cutting apparatus should be so constructed as to guard effectually against clogging and to save power in cutting. Important facts bearing upon this feature were observed at the Syracuse Trial. The use of the wide guard which divides and presses the grain to the cutter, in more than one case was shown to diminish the power expended in the act of cutting. Our own observation during the last harvest attests the truth of this principle. We used Morrison's Machine, in which there is an arrangement that subserves this purpose, and which possesses the additional advantage of presenting a self-adapting cutting edge to the edge of the knife.

4th. There should be a simple effective means of elevating and depressing the cutter-bar.

5th. Every machine should be so constructed as to be readily thrown in and out of gear.

6th. As, to repeat our language on another occasion, no machine is stronger than its weakest part; that is to say, when any, even the weakest part breaks, the machine must be repaired; it is important that this weakest part be that portion which can be most easily and expeditiously and cheaply repaired. It should not be the wood work, because it is impossible to replace that without too much loss of time; nor should it be the castings, because you have to send to the machine shop or the foundry to replace them. Let it be then some part made of wrought iron, like the crank handle of Morrison's for instance, which can be easily detached and repaired in an hour.

7th. Let each one study the adaptation of the reaper to his particular land. There are, e. g., some excellent reapers for smooth land, which cannot work at all on beaded land.

If any one who desires to purchase a reaping machine, will be guarded in his selection by these suggestions, he will not, in my judgment, greatly err. We publish them in April because each man should have his reaper at home by May. If he does not engage them in time, he may have a very inferior machine—made in a hurry, or may fail to get one altogether.—Ed. Southern Planter.

MACHINES ENTERED FOR COMPETITION.

Mowing Machines.

INVENTORS. OWNERS. RESIDENCES.

Pells Manny, Pells Manny, Freeport Illinois.
J. E. Heath, A. H. Caryl, Boston, Mass.
William F. Ketchum, William F. Ketchum, Buffalo, N. Y.
E. Ball, Ball, Aultman & Co., Canton, Ohio.
Aultman & Miller, Ball, Aultman & Co., Canton, Ohio.
J. H. Manny, with Wood's Improvement, Walter A. Wood, Hoosick Falls, N. Y.
Thomas D. Burrall. Thomas D. Burrall, Geneva, N. Y.
Martin Hallenbeck, Martin Hallenbeck, Albany, N. Y.
William A. Kirby, Buf. Ag. Machine Works, Buffalo, N. Y.
William H. Hovey, William H. Hovey, Springfield, Mass.
R. L. Allen, R. L. Allen, New York City.
J. E. Newcomb, Pruyn and Lansing, Albany, New York.
Moore & Patch, Miller, Wingate & Co., Louisville, Ky.
C. H. McCormick, C. H. McCormick, Chicago, Illinois.

Mowing and Reaping Machines combined.

Pells Manny, Pells Manny, Freeport, Illinois.
A. H. Caryl, A. H. Caryl, Boston Mass.
William F. Ketchum, W. F. Ketchum, Buffalo, N. Y.
J. H. Manny, with Wood's Improvement, W. A. Wood, Hoosick Falls, N. Y.
Seymour & Morgan, Seymour, Morgan & Allen, Brockport, N. Y.
Thomas D. Burrall, Thomas D. Burrall, Geneva, N. Y.
W. A. Kirby, Buf. Ag. Machine Works, Buffalo, N. Y.
Warder, Brokaw & Child, Warder, Brokaw & Child, Springfield, Ohio.
Obed Hussey, T. R. Hussey & Co., Auburn, N. Y.
Ketchum & Hull, Hull & Sanford, Poughkepsie, N. Y.
Moore & Patch, Miller, Wingate & Co., Louisville, Ky.
John S. Wright, Rufus Dutton, Dayton, Ohio.
R. L. Allen, R. R. Allen, New York City.
Dietz & Dunham, F. J. Frelinghausen, Raritan, N. J.

Reaping Machines.

Pells Manny, Pells Manny, Freeport, Illinois.
Jonathan Hanes, Jonathan Hanes, Pekin Ill.
J. H. Manny, with Wood's Improvement, W. A. Wood, Hoosick Falls, N. Y.
Seymour & Morgan, Seymour, Morgan & Allen, Brockport, N. Y.
Thomas D. Burrall, Thomas D. Burrall, Geneva, N. Y.
Warder, Brokaw & Child, Warder, Brokaw & Child, Springfield, Ohio.
Jearim Atkins, Rufus Dutton, Dayton, Ohio.
Moore & Patch, Miller, Wingate & Co., Louisville, Ky.
C. H. McCormick, C. H. McCormick, Chicago, Illinois.

Burrall's is distinguished for its single gearing and general simplicity, in which particular it excels all other geared machines. As each motion of the knife passes two fingers, it gives a cutting power to compensate for its less multiplied motion. A large space is cut twice over and a portion three times over, which seems an unnecessary waste of momentum.

The gearing consists of one large crown wheel and one pinion, being placed on the left side of the frame and the knife on the right. There is a balance wheel, the diameter, weight and speed of which, seem more scientifically adjusted to overcome the momentum of the knife than any other. It seems to us, however, that it would be much improved by bringing it forward on the shaft and nearer to the pitman. The pitman boxes are of brass, the rest of iron. It is not excelled for durability. The frame and cutter-bar being of iron; and the workmanship is excellent.

Pruyn's & Lansing's invented by J. E. NEWCOMB. While we cannot recommend the cam principle in the present state of our knowledge and experience, we cannot withhold the tribute of our admiration to the ingenuity displayed in the construction of this machine. Simplicity can be carried no further. The frame is in one piece, so that the wheel, cutter-bar, tongue and regulating roller can be attached without intermediate additional pieces, or bolts. The cam is on the interior of the driving-wheel, and is thus protected from dirt and stubble, to which others are liable. The friction-rollers are on both sides of the cam, which diminishes the wear on it by one-half. These points give it, in our opinion, a great superiority over other cam machines.

The same cap which holds the journal of the driving-shaft, is in the center of oscillation of the lever, and brings it to a level with the cutting-bar, without any additional pieces or bolts, requiring only four bolts to hold the whole frame and driving-power together. The boxes are of Babbet-metal. A small friction-roller on each side of the cam, imparts a reciprocating motion to the lever, the long end of which connects with the knife, and imparts to it its vibration. By this arrrngement, a motion on the cam of three-quarters of an inch, causes a vibration of the knife to the extent of two inches. The points of the wedge-form guards are four inches apart, the spaces at the points of the blades but two inches; hence, a stone larger than two inches in diameter cannot reach them. The reciprocating-bar seems needlessly heavy, causing an unnecessary expenditure of power at every vibration. If cam machines are ever made available, we think this is the basis on which they must be con-

structed. The extreme cheapness of this machine, renders it desirable that it should prove successful. Its work was excellent. It cut perfectly, as slow as the horses could walk; stops in the grass; starts, and cuts with perfect ease without backing, and there is no difference in the length of the stubble at the point where the stopping and starting took place, from what it is in parts where it was continuously in motion.

R. L. Allen's machine is one of excellent character. It is very strongly built, the strength of material judiciously distributed, the workmanship is of the very best character, and the materials of the first quality. The seat of the driver is more convenient and comfortable than any other, and would have been so marked in the Table, but that in the judgment of the mechanical committee, it was less safe, from the fact that it was placed *before* the knife, and therefore, in case of being thrown off, the driver would be more likely to be injured by it than if it were behind. The journal-boxes are of composition metal, and it runs with very little noise. While cutting at a speed of three feet per second, it cuts smoothly, leaving a stubble of two and three-fourth inches; but when stopping, and starting in the grass without backing, the stubble was five inches at the place of stopping, and there was a slight pulling when the machine started. All the machines, except Allen's and Wood's, were tried in dry grass. Theirs was tried in grass wetted by a recent rain, which made the test more difficult; and it is no more than justice to say that their regular driver was absent, and his place supplied in the slow trials by a boy who had never managed the machine before. On the whole, we consider this machine to be one of a very high character: light of direct draft, and totally free from side draft.

Walter A. Wood's machine is very remarkable for the small amount of power expended in the single act of cutting. We should have suspected some error of observation, had not the same thing been manifest in *both* of his machines, which were tried at separate intervals. When this peculiarity was developed by computation and tabulation (before which it was wholly unsuspected by us,) we were unable to account for the fact from the structure of the machine, and therefore requested the inventor (by letter) to give us his theory of the fact. He referred us to the following passage in his printed circular, which he deemed a sufficient solution to the mystery:—"The use of the wide guard which divides and presses the grass to the cutter, and holds it in a position to be cut easier, or with less power than when driven to a narrow guard by the cutter itself.—Experience has fully proved, that the nearer we approach to a continuous cut, and have enough of space left for a clip, the less the power required to cut grass or grain." The circular containing this passage was handed to us at Syracuse, but its force escaped our notice.

On carefully comparing the guard use in this machine, with others, we are inclined to concur with Mr. Wood in the main, with respect to his arrangement. We are, however, of opinion that the case of cutting depends not so much on the width of guard, as it does on the angle between the guards and the knife-edges.

In Ketchum's machine which is the pattern from which most of the other machines are copied, in this particular, the distance between the fingers, from centre to centre, is the same as Wood's; but the fingers are equal in width throughout, viz, three fourths of an inch, which makes the space to be passed over by the grass before it is cut, nearly twice as great as Wood's. It is, consequently, chopped off in a leaning position with one tooth of the bevel-wheel. But in Wood's, the angular guard with its broad base, parts, and holds the grass out half way to the knife-edge in a proper position to be cut easily, and is sheared off with the knife-edge by three cogs, instead of one. In a word, the cut of Wood's knife resembles the *drawing saw* cut, while the others approximate more to the square chisel cut.

We are more fully confirmed in our opinion, by finding in Table D that Pruyn & Lansing's machine is next to Wood's in the power expended in cutting, and it also resembles Wood's more clearly in the shape of its finger, or guard, than any other.

The wide guard has a tendency to exclude small stones from between them, thus protecting the point of the knife. If the height of the knife above ground is greater than half the diameter of the stones which could pass between the guards, they would always clear the knives below. If larger, (and loose,) so that the guards strike below the centre of the stones, they would be thrown above. These views will account for the closeness with which Wood's machine was enabled to cut in the clover lot, notwithstanding the stones. Another signal advantage in Wood's machine is the arrangement by which the driver is enabled to raise or depress the cutter-bar while in motion, and its flexibility on the ground in consequence of the joint by which the tongue is attached to the frame. It is exceedingly portable and compact, and the workmanship is excellent throughout. We think it could be improved by putting in composition or Babbet metal boxes, and by making the angle of the cutting-edge of the knife smaller in relation to the base. Wood's machine and Hallenbeck's were the only machines which *never* clogged in any degree or under any circumstances. It cut perfectly well in heavy wet grass, (same as in Allen's trial,) travelling three and a half feet per second, leaving a stubble of two and a half inches long; when stopped, and started without backing, the stub-

ble was only half an inch longer than when cutting continuously. Nothing could be finer than its action in slow cutting. The apparatus for throwing in and out of gear by a cam wedge we consider better than any other.

F. J. Frelinghausen's (Dietz & Dunham) machine. This is a cam machine, having the cam on one side of the driving-wheel and unprotected from dirt, differing from Pruyn & Lansing's which has the cam on *both* sides and protected from dirt. The vibratory motion of the knife is produced by two small rollers, or wheels, attached to opposite ends of a reciprocating bar, working alternately in the cavities of the cam. The seat for the driver is furnished with springs and is very convenient.

William H. Hovey's machine. The peculiarity of this machine consists in the separation of each knife, and they are fastened without being riveted. A pin with a large head is fastened to the lower bar, a hole in each knife is slipped over the head, a slot at the side of the hole permits it to be slid laterally along the shank of the pin, which fastens it, the large hole is then accurately fitted by a projection on a steel button working on the upper bar. The object aimed at is very important,—the knives are only imperfectly ground when fastened to the bar, and it is often very desirable to replace a broken knife without leaving the field. By this contrivance the knives can be easily ground or replaced; but we have some doubts about the permanence of the fastening, which can only be settled by a longer trial.

There is a spur-wheel on the main or driving-wheel, the gearing not very well made. There is a small balance-wheel; but with the imperfect gearing does not prevent some rattling.—We think it is too complicated for general use. It cuts well when moving at the rate of two feet per second; but drags more than some others when starting in the grass from a dead stand. It has iron journal-bearings, and brass boxes in the connecting bar.

M. Hallenbeck's machine. The Mechanical Committee say, "We look upon this as one of the best in mechanical construction—combining the greatest strength, with the smallest amount of material, of any at this Exhibition." The journal-bearings are of a mixture of copper and tin, their seats are planed, and a strap over the frame confines them tightly in their places, keeping them always in line. The distinguishing peculiarity is in the construction of the fingers or guards; the groove in which the knife bar works is sloped from the center both ways, thus leaving but a small bearing for the bar; the double wedge-formed cavities thus left across each finger immediately under the base of the blades, permits the loose grass, which would otherwise clog the machine, to work easily through them—the under part, at the shoulder, being formed in a quadrant, and the top guard being elevated from the point of the knife, adds to the security against clogging. All the gearing is well made, which, together with the well proportioned and counter-poised balance-wheel, causes it to work beautifully without rattling. The loose joint by which the frame is connected with the tongue, permits the cutter to follow the inequalities of the ground without bearing on the necks of the horses. It works well with a very slow motion, and starts easily from a dead stand. It did not clog at all under the most trying circumstances.

Ball, Aultman & Co., (E Ball's machine.) This is a very superior machine—the only drawback to its excellence being its weight, price and complexity. It has two driving-wheels, instead of one, placed side by side like the wheels of a cart, giving great firmness and steadiness in running. The cutter adapts itself with great perfection to all the inequalities of the ground, so that either end, and the front or rear of the knife, is adjusted to the uneven surface by means of a double-hinge joint. Either driving-wheel acts independently of the other, or both may act in conjunction. When the machine is moved in a curve, either to the right or left, the knives are kept in a proper motion. A rachet-wheel suspends all motion when backing; this motion can therefore be as easily affected as in an empty cart. The cutter bar can be very speedily removed, when the machine will answer very well for a buggy. It cuts well at a very slow motion, though the stubble is about an inch longer than when cutting faster. It starts easily in the grass from a dead stand; no machine excels it in this respect. The gearing is very good,—the large wheel has the cogs on the interior face, which is the best form from its bringing a greater number of cogs in contact with the cogs of the pinions, lessening the pressure on each, and of course diminishing the liability to break and wear. It has a well counter-poised balance-wheel, which conspires, with the well made gearing, to give a quiet motion without rattling. The journals run into iron boxes, Babbeted.

Ball, Aultman & Co., (Aultman & Miller's machine.) It is very similar to the other—the gearing is less compactly arranged, though not more complex. The large cog-wheel is a crown wheel, and therefore (as explained above) is inferior to internal gearing. The peculiarity of its construction consists in an apparatus by which the cutter-bar is folded over on to a frame almost as easily as a bird folds its wing—giving great portability to the machine.

By means of a lever, easily operated by the foot of the driver, the cutter-bar is raised over stones and other obstacles. If we do not misremember, this last peculiarity is possessed by the preceding machine—although our notes do not state the fact. Another valuable feature, though a small one, is the security given to the journal boxes of the pitman by a rachet spring-key, which cannot possibly be shaken out,

though it may easily be removed by a delicate pen-knife.. Its cutting qualities are very similar to Ball's machine.

A. H. Caryl. This is a cam machine, the cam being formed by a zig-zag space between the portions of the rim of the driving-wheel—a small friction-wheel connected with the cutter playing in this space. The Description Committee say of this, "There is a great loss of momentum in this machine, from two causes, viz: the whole distance travelled by the blades, backwards and forwards, (an inch and a half,) has to be travelled by the wheel between the cams, there being no increase of the vibratory strokes by means of a lever, as in Pruyn and Lansing's. Also from there being no guards, (the lower knives being immovable) it requires great thickness of blade to prevent them from bending up when dull: and the increased weight consequently augments the momentum and wastes force, hence the great thumping noise and waste of force. The open space between the cams, are liable to become covered and filled with earth, and to wear the rollers. The same objection exists to all cams on the side of the wheel, but not to Pruyn & Lansing's." The cutting principle is peculiar: what in other machines is simply a finger, in this is a stationary cutter, so that the operation of cutting resembles the action of a pair of shears. This machine (probably from some mechanical mal-adjustment) worked badly from the beginning, and was withdrawn; but we can readily understand, that at first, when in perfect order, it will do beautiful work; but as soon as the knives are dull, or a joint or rivet loosens, it must necessarily clog and work badly. It was not tried in slow motion.

William F. Ketchum. We are much interested in this machine as the matured production of a man who was the pioneer in successful mowing by machinery. The distinguishing feature of this machine, is placing the cutter-bar in a line with the axis of the driving-wheel, which obviously gives it a great advantage in passing over water-furrows, since the finger-bar must follow exactly the motion of the wheel. The perforated knife is claimed by the inventor as a perfect antidote against clogging; but the following extract from the report of the Committee on Quality of Work, shows that it cannot be relied upon in all cases:—"The grass was heavy and much lodged. The horses labored hard, and one man was assisting to clear the machine, which clogged badly. While some good work was done in spots, the general performance was far below the reputation this mower has justly earned upon other occasions." The Description Committee say, "The form and size of the cogs, and the gearing generally, render the working of this machine more imperfect than some others, running with more noise and rattling; the surface of the cogs not being in all cases wholly in contact, wear unequally. The large cog-wheel is a bevel-wheel, which does not secure quite so perfect motion as interior cogs." The whole machine is made of wrought and cast iron, and the cutter-bar is flexible to the extent of four inches, which has a tendency to diminish the severe side-draft, when a stiff bar rises over a stone or knoll. There is no balance-wheel, which, together with the somewhat imperfect gearing, produces a good deal of rattling.

Buffalo Agricultural Machine Works. (The Kirby machine.) The chief peculiarity of this machine, consists in the independent action of the finger-bar, which is secured by the peculiar mode of attaching the driving-wheel to the frame, so that the wheel in passing over uneven ground does not carry the finger-bar up and down with it, but each acting independently, the fingers follow the ground. This independent action and flexibility of the finger-bar, lessens the liability to breakage when in contact with obstructions. It also permits the finger-bar to be set at any desired height, and to facilitate its motion in soft ground. This contrivance for securing the rise and fall of the cutter-bar, is very ingenious, and is worthy of commendation. The gearing is good, but not as well adjusted as some others—the balance wheel being small and without counterpoise, causes some rattling, while in motion. This machine had the misfortune to draw the worst lots, in both fields, which made its performance seem worse than it really was. We consider it a good and useful machine, destined, when improved by the suggestions of time and experience, to take a high rank.

T. R. Hussey. This machine is so well known that description is unnecessary. The interior gearing is commendable; the balance-wheel is not well adjusted—it is small, with a large counter-balance, and rattles very badly. The tables show that it is not the best machine for mowing.

Warder, Brokaw & Child, (Ohio Harvester.) The gearing is internal and generally well made. The boxes are of iron, except those for the connecting-rod, which are of brass. The frame is of wood, the cutter-bar of iron. The plan of raising and depressing the cutter-bar to change from mower to reaper, and *vice versa*, by means of an iron brace with slot and notched fall, appears less convenient than some others. The very acute angle formed by the brace with the tongue, makes it liable to hard strain. In motion, as slow as the horses could walk, this machine performed well and started very well from a dead stand. It is a new machine, and not fully perfected for mowing.

Hull & Sanford,—a modification of Ketchum's. The gearing interior, and tolerably well made. The boxes are of Babbet metal. The Descriptive Committee say,—"The facility in raising and depressing the cutter-bar, and the manner by which this is effected by two distinct centers to the driving-wheel and to the

other gearing, is ingenious and convenient." The mowing was not of the best character, the stubble seemed rather torn than cut off. The imperfect work may have been due to the bad temper of the knife, rather than to inherent defects in the machinery.

Miller, Wingate & Co. The most noticeable feature of this machine is its cutter-bar, made of boiler plate-iron doubled over so as to leave an open space between the top and bottom plates. The shanks of the guard-fingers are secured by rivets within this space, which gives it great strength in proportion to its weight. Its journal-boxes are of iron; boxes of connecting-rod brass. It has a balance-wheel, but no counterpoise, and rattles some, though less than some others. It cuts the grass tolerably well, and leaves it evenly disposed on the ground. It works well in slow cutting.

Pell's Manny. This machine, used as a mower, resembles the machine of J. H. Manny in its main features, though somewhat more complex. The gearing was not well made; the bevel gear did not coincide, in consequence of the points of the cones not meeting together, and hence, only a portion of the face of the cogs touched each other, leaving one half their length out of contact. This, it is true, is an error in the manufacture only; but many machines, good in principle, are cast aside and condemned for just such imperfection in the manufacture. The journal-boxes are of cast-iron. The work of this machine was fair, but it clogged occasionally. His smooth mowing-knife was broken in the cars, and he was therefore compelled to use his sickle-edged reaping-knife.

Seymour & Morgan have a very good machine, but it is evidently more fully calculated for reaping than mowing. It did its work, however, respectably in the meadow. Clogged occasionally. They did not finish their work in the clover field. They arrived late, and found that the reel-divider would not work in the tangled clover—erroneously supposing that they would be compelled to finish just as they began, they abandoned the field.

Rufus Dutton. (Atkin's Automaton Reaper.) The gearing of this machine is admirable, and surpasses in accuracy and finish any on the ground. Where the cogs brightened by wear, the polish was equal throughout the whole length of it. The workmanship throughout was thorough and conscientious, affording a marked contrast to many others. It is rather complicated, as a mower.

Cotton.—At Apalachicolo, on the 13th inst., the stock of cotton on hand, including all on shipboard not cleared, was 22,873 bales, against 20,264 bales at the same time last year. The Memphis *Bulletin* says that the shipments of cotton from that place during the month of February amounted to 40,000 bales.

THE SOUTHERN PLANTER.

RICHMOND, VIRGINIA.

☞ Sickness in Mr. Eggeling's family has prevented him from furnishing his contributions to the Horticultural Department this month.

☞ By an accident in mailing the March number of the Planter, we sent, through mistake, a few packages of the February number. Subscribers who received them, can have the March number sent them by notifying us.

To Correspondents.—We have received several communications this month, which we are compelled to omit for want of space. They will appear in our next.

"Hedges and Evergreens."

We have received from the publisher, but have had no time to examine, "*Hedges and Evergreens*"—a complete manual for the cultivation, pruning and management of all plants suitable for American Hedging; especially the maclura or osage orange. Fully illustrated with engravings of plants, implements, and processes, to which is added a treatise on evergreens, their different varieties, their propagation, transplanting and culture in the United States, by John A. Warder, M. D., Editor of Western Horticultural Review, President of the Cincinnati Horticultural Society, &c. Price $1, New York. A. O. Moore, Agricultural Book Publisher, 140 Fulton Street.

Mr. Moore is the successor to Saxton. We wish him success in his present business, and a better selection of books than Mr. Saxton published.

Dr. Higgins' Report.

Just as we are going to press we receive from the author, Dr. James Higgins, State Chemist in Maryland, his sixth annual report. We have had no time to examine it.

We are very sorry to see that Dr. Higgins has been displaced.

The Thorough Bred Stallion---Trojan.

In our notice of the fine horses that are advertised in the Planter, we accidently omitted to speak of Trojan, the thorough bred stallion of Mr. Gaines, of Charlotte County. His premium as the best thorough bred stallion exhibited at our last fair, awarded by a committee of JUDGES, is a sufficient guarantee of his points and his pedigree.

Peabody's Premium Prolific Corn.

The subscriber being the original introducer of this remarkable Corn, has taken every precaution to keep the seed pure. It is well known that corn will mix from the pollen of the flower, from three to six hundred yards. I have cultivated no other kind of corn, either in my field or garden. Nor have I neighbors near enough to mix their corn. The productive qualities of this corn this season fully sustains its previous reputation. My lands are common pine lands, bringing from 10 to 12 bushels of the common corn to the acre. I manured my corn land this season with one sack of guano (about 160 pounds) to the acre, and notwithstanding a drouth of seven weeks, when the corn was in a most critical state, some of the acres have turned out more than one hundred bushels of shelled corn to the acre. In selecting this corn for seed, I shall only take the sound, perfect ears, carefully rejecting all unsound grains, and shall put it up in strong sacks of one bushel, half bushel, peck, and quart, each sack distinctly labelled in printed letters, *Peabody's Prolific Corn.* The prices will be as follows: For one bushel $10, half bushel $5, peck $3, quart 50c. My authorized agents are:

King & Sorsby, Gunby & Co., and Marcus & Ragland, Columbus, Ga.; Lee & Norton, Montgomery, Ala.; Pomeroy & Marshall, Mobile, Ala.; J. A. Morton & Co., New Orleans, La.; Chandler & Co., Memphis, Tenn.; B. S. Weller, Sr., Nashville, Tenn.; Wm. M. Lawton & Co., Charleston, S. C.; Peter & Buchanan, Louisville, Ky.

Each Agent will be supplied with my written certificate of agency. There will no doubt be much of this corn offered in the market this season, but as purchasers wish it for seed, they want it pure, and that which has been grown upon a plantation in the neighborhood or vicinity of other corn, cannot be perfectly pure.

For the accommodation of those who live remote from railroad stations, I will put up packages to go by mail. On the reception of one dollar, I will mail a bag containing eight ounces of corn, and prepay postage. Orders may be addressed to me at Columbus, Ga., or to either of my agents named above. All mail orders to be addressed to me. Purchasers will be furnished, on application, with my method of planting and culture.

The following is the method by which the twenty-five acres was planted and cultivated, which took the First Premium for the largest yield, at the Alabama State Fair, held in the City of Montgomery November 17th, 1857:

The land was frequently ploughed just before planting time, and then sub-soiled as deeply as two mules could pull the sub-soil plough. When well prepared, furrows were run five feet wide, as deep as two long point scooters, one after the other, could open them. In the bottom of this furrow, every four feet, I dropped a table spoon full of guano. This I covered with earth, and over it dropped Two grains of Corn. When the Corn was up from four to six inches high, I thinned it out to one stalk to a hill, and gave it a deep ploughing with a scooter plough.

All the after culture was given with the horse hoe, an implement that stirs the soil, kills the grass, and leaves the surface perfectly level. When the Corn is ten inches to two feet high, it will begin to Tiller. The *Tillers should not be Taken off.*

In rich soil, the Tillers will be more numerous than on poor—therefore, the better the land, or the greater the quantity of manure used, the more corn. Observe the Tillers in the engraving—the ears are as fine as on the main stalk. Where this Corn is wanted for Seed, it should not be planted near any other kind of Corn, as Corn will mix two hundred yards.

Let it be Remembered by the Planter, That the richer the soil the greater the distance the Corn should have, and in no case should but one stalk be left in a hill, and all the Tillers left to grow that may shoot. On lands that make thirty bushels of common Corn to the acre, *One Hundred* of this Corn can easily be made, and on the rich Corn lands of the West, it will make two hundred bushels to the acre averaging over sixty pounds to the bushel shelled.

CHARLES A. PEABODY.

Columbus, Ga., February 12th, 1858.

☞ *Please show to your Agricultural friends.* ☜

Accompanying the circular, from which the above are extracts, came a box to us containing samples of the ears and stalks of the Peabody Corn, and a small bag of the same for ourselves, for which Mr. Peabody will please accept our thanks.

That Mr. Peabody really did make the crop of corn he took the Premium on, we shall not dispute; as little that one or two persons made large profits on the sale of Morus Multicaulis; that Mr. Iverson made—was it four

tons per acre?—of the Rescue grass, in something less than no time, by his own shewing; that the West Indies will be outdone by Connecticut in the Sorgho and Imphee; or that Jack the Giant Killer accomplished wonders by means of a very prolific bean—*not* the Chinese prolific *pea*. Nevertheless, we cannot advise our readers to purchase the corn for seed unless Mr. Peabody will send persons to grow it for us. We do not speak unguardedly, because we tried a sample sent us last year; and not a sucker did the corn produce; and no better crop than we might have grown on the same land—stiff upland, limed and manured, and in pretty good heart—with our own seed.

Supposing the corn to be quite as good as Mr. Peabody thinks it, no man can afford to purchase it at the price he asks; for it will do him no good for seed if he has to grow it upon a plantation in the neighbourhood or vicinity—to wit, "six hundred yards"—of other corn. He must, therefore, obtain seed enough for his whole crop, and for his neighbours too, that it may not "mix." This, at ten dollars a bushel, would be rather hard even for corn which, on "common pine lands, bringing from ten to twelve bushels of the common corn to the acre," manured with only "160 lbs. guano to the acre," should, "notwithstanding a drought of seven weeks," produce "more (how much more?) than one hundred bushels of shelled corn to the acre." By the way, if that corn had been manured with the CONGLOBATED SUCCEDANEUM, or essence of tumble-bugs, of our friend, FAIR MIXTURE, Esq., which, it may be remembered, when tried at pine thicket, on a roasting-ear patch, "produced seventeen ears on a stalk, each ripening just in time for table use," and which applied in another field,—"a handful to the hill,"—"gave twenty-two ears to a stalk, and all hard on the 4th of July, two days after the silk appeared;" if, we say, the CONGLOBATED SUCCEDANEUM had come in contact with Peabody's Prolific, would not the product have jarred the ground, if not frightened it into an earthquake?

We advise our friends to wait awhile. Perhaps the corn may fall. One hundred bushels per acre, at ten dollars per bushel, is one thousand dollars per acre. Twenty-five acres is twenty-five thousand dollars; and that for four years—the Presidential term—will make a man rich enough to authorize his selling afterwards at a living profit. Meanwhile, let our friends wait in patience and see the issue.

Seriously: does any one else believe what Mr. Peabody does of this corn? We say what he believes, because people can persuade themselves of absurdities which more disinterested, or less enthusiastic parties can see through at a glance; and Mr. Peabody is most probably one of this class. If any one thing has been established in Agriculture beyond dispute, it is that the quality of the land decides the quantity of its product. One may as well attempt to graze a Shorthorn on the sands of Southampton, or to rear a Cotswold on the bald hills of Fluvanna, as to grow a crop of corn of one hundred bushels on land whose fertility is not equal to an average of more than ten. We know: we have tried this very thing. In 1844, a friend sent us a six eared corn, made by annually selecting the best ears from corn that had been grown for a considerable period on the rich low grounds of Tree Hill. We planted that corn for three years on very fine upland, whole fields of which had sometimes averaged us fifty bushels per acre; and though its prolific habit continued, the ears dwindled in size to nubbins. It was only a year ago that our esteemed friend, Dr. Morton, of Cumberland, communicated to the Planter the established fact, that corn would always adapt itself to the land it grew on, and would lose in weight and size when transferred from a rich to a poor soil. Nor do the facts which each one's experience may oppose to this doctrine really contradict it. The deterioration is not immediate, because the opposite *habit* has been established; and for a while the habit may continue; but ultimately, and before a great while, the habit, whether of plant or animal, is conformed to the circumstances of its nutrition. Otherwise, we should see Shorthorns in the Hebrides, Suffolk Punches in the Shetland Islands, and wheat in Sutherland.

It is true, that within the limitations of this law, a great deal may be done by judicious selection. Particular individuals develop greater hardiness of constitution, that is to say, they assimilate more readily the nutriment that is offered, and from greater vigour of organism, they resist the deteriorating influences which operate upon the whole class.

Clearly, those individuals will communicate such traits; but there is the same limit to development of that kind that there is in the approach of the Laplander to the stature of the Englishman.

The case of Mr. Peabody's corn may not be an exception to this rule, and for his own sake we hope it may not be, though we suspect it is. It will be observed that he ploughs his land very deeply, works it by "*frequent* ploughings *before* planting," manures it well, and cultivates it thoroughly. Now, these are conditions to which his other corn has not been submitted; and yet by such conditions it might be developed very highly. Has not Mr. Peabody, in fact, produced this very corn he now offers to sell, by some such process of extraordinary attention? for he says he was the original introducer of it. How came he by it at first? If he did improve it to its present assumed stage of productiveness he deserves credit for it, and but for the cash he wants, we would award it to him freely. It is a valuable lesson to us all, so far as the effect of selection is concerned; but it will do much mischief if people think it teaches them that like will produce like except under like conditions.

Does the corn then possess no value? Yes; possibly it does. On the richest alluvions, where it is hard to get enough corn on the ground, and productiveness cannot be taxed to its utmost capacity without planting the ordinary corn so thick that it "spindles," it may answer a good purpose. We shall try our share on land of that character, "six hundred yards" from all other corn, and out of the way of everything but high water; and report progress.

But we advise those who think of trying it on "common pine land," to ponder the following case which they will find reported in Don Quixote: "At this instant two men came into court; the one appeared to be a country fellow and the other a tailor, having a pair of shears in his hand. 'My Lord Governor,' said the tailor, 'we come before your worship by reason this honest man came yesterday to my shop—for, saving your presence, I am a tailor, and, praised be heaven, have passed my examination—and putting a piece of cloth into my hands, 'Sir,' said he, 'is there cloth enough here to make me a cap?' Wherupon, I, after measuring the piece, answered 'yes.' Now he supposing, as I supposed, (and indeed I was right,) that doubtless I had a mind to cabbage some of his cloth—grounding his suspicion upon his own knavery and the bad character of tailors—bid me look at it again, and see if there was not enough for two. I guessed his drift and told him there was. He, firm in his knavish conception, went on increasing the number of caps, till we came to five caps. Well, the caps I made, and just now he came for them. I offered them to him, but he refused to pay me for my work, and now wants me either to return him his cloth or pay him for it.' 'Is all this so, friend?' demanded Sancho. 'Yes!' answered the other man; 'but pray, my lord, make him show the five caps he has made me.' 'With all my heart,' answered the tailor; and pulling his hand from under his cloak, he showed the five caps on the ends of his fingers and thumb, saying, 'here are the five caps this honest man would have me make, and on my soul and conscience, not a shred of the cloth is left; and, as to the workmanship, I am ready to submit it to the view of any inspectors of the trade.' All present laughed at the number of caps," &c., &c.

Manner of Cultivating Water-Melons in Hanover, and value of the crop.

The following article on the mode of raising water-melons in the county of Hanover, and the value of the crop was solicited by us from our friend—our old friend—Wm. B. Sydnor, Esq. As he is a successful and thoroughly practical farmer, we claim for this article the perusal of every man who wishes to raise good water-melons. As to selling them, that is another matter. They are "the peculiar institution" of the lower part of Hanover County, and have been for "time whereof the memory of man runneth not to the contrary." And she not only raises them of better quality but sells them with more judgment than any other county. Rivalry, therefore, being out of the question, Hanover generously tells her neighbours how to make the fruit and proudly says beat us in the market if you can.

[Ed. So. Pl.

Mr. F. G. Ruffin:

Dear Sir—In compliance with your request I send you the following statement, which I

think will give you the usual method adopted in our county for cultivating water-melons.

In the first place, I would say the land must be good; not very rich, not very poor, say such as will, without manure, make five barrels corn, or ten or twelve bushels wheat per acre. Medium texture, neither stiff nor too sandy, slightly undulating, or sufficiently so for excess of rain water to pass off freely, but not steep enough to wash. A Southern exposure is to be preferred for forward melons. The land to be deeply and thoroughly ploughed—to be checked off ten feet each way for the hills. The checks to be well opened for receiving the manure, the sub-soil, or hard ground in the bottom of the holes to be loosened up or entirely removed, and replenished with the top soil. About an even half bushel of well-rotted stable manure to be put in each hill, and enough earth worked in with the manure to leave the hill when completed about four or five inches high. Some persons succeed well without working the manure up with the earth, but make the hill over the manure.

Planting is done in all the months of April and May. Seed *two years old and more* are preferred to those one year old. About ten seeds are put to a hill, and half as many added every week or ten days till a good stand is secured. These should be covered from one to two inches deep—deeper in dry weather than wet. Thin out the plants at different times as you hand-work them, until they are reduced to two. This last thinning should not be made till the vines begin to run. Never permit them to get grassy, and continue to work them till the vines are meeting.

An acre of land is sufficient for 500 hills, and with an average season will make from one to two hundred dollars gross.

The cost of hauling and selling them in market is about one third of this sum. All farmers in the lower end of the county make some for market, varying from one to five hundred dollars' worth. I think it is reasonable to say that twenty thousand dollars are annually received in this portion of the county, embracing perhaps one fifth of the same.

Musk-melons require the same treatment, only requiring half the manure to the hill, and the hills to be five instead of ten feet apart.

Wishing that some more skilful cultivator and experienced writer could have been called on for this communication,

I remain Yours,
Most Respectfully,
W. B. Sydnor.

Hanover, March 18, 1858.

The Next State Fair.

The next Fair of the Virginia State Agricultural Society will be held in Petersburg.

As this step has excited some dissatisfaction, and we have even heard it charged that ingratitude has been shown towards Richmond, we deem it not improper to offer the following explanation.

The constitution of the Virginia State Agricultural Society is imperative that an annual Fair shall be held: it is also explicit in forbidding the expenditure of one cent of its capital. Its interest, therefore, is the only fund that the Executive Committee can rely upon as a certainty to meet its expenses; the balance being derivable from the annual payment of members, from gate money and from appropriations from some quarter, such as have heretofore been made by the City of Richmond. Now the amount of interest applicable to this purpose—the balance being a fund for necessary expenses of the organization—is only about $1,500, possibly not quite so much. The expenses of each Fair have been about $10,000, leaving $8,500 to be realized from other sources than interest on capital. The annual membership receipts, with a constant tendency to diminution, amounted last year to $3,800; the receipts at the gate to $2,600, or a total in these items of $6,400. The interest on capital and the above receipts foot up about $8,000, or $2,000 *short* of the expenses of each Fair.

Last year Richmond gave the Society $1,000, and the Fair expenses amounted to less than $10,000. In that way the Society "cleared itself:" and that was all.

But to do this much even for another year, it was necessary that we should have a guarantee of such weather as has hitherto blessed our exhibitions. This being impossible, application was made to the Council to submit to a vote of the citizens of Richmond a proposition to give the State Agricultural Society a permanent annual endowment of $3,000. The application was rejected. This left the Executive Committee the alternative of looking for terms elsewhere, or of fixing the next Fair at Richmond, and taking the risk of incumbering the capital of the Society with debt. For, if from bad weather or any other cause the receipts had fallen off, the interest, as has been shown, could not meet the deficiency. It is true, that the Council indicated a willingness to give $1,000 to the Society. But that offer amounted to nothing. The whole sum would have been swallowed up by the rent of the horse lot—if it could have been had for that—and nothing

would have been left for the repair of the Fair Grounds, now become indispensable.

Under this state of facts, actual and contingent, and bound to have an exhibition somewhere, the Executive Committee made proposals to other cities; and Petersburg and the Union Agricultural Society offered $4,000 for the exhibition at Petersburg; and in addition so much as may be necessary to pay all expenses of the Fair if the gate receipts should prove inadequate. The offer was accepted; and the Fair will be held there. Nor was Petersburg the only bidder. Wheeling, with a public spirit which entitles her to as much in praise as Richmond may claim in gratitude, offered $10,000 if the Fair should be held there.

This offer could not be entertained, because it would cut off the meeting of the Farmers' Assembly entirely, or at least render it doubtful, if a quorum could be had—a thing the more likely to occur as it has been always exceedingly difficult to have a quorum here in Richmond, and we had none at all last year. But the committee felt none the less bound to acknowledge the liberality and magnificence of the offer, and deeply regret that circumstances prevented them from considering Wheeling as a competitor. We should suppose that the people of Richmond would admit that $10,000 for one year would entitle Wheeling to as much gratitude from the Society as the sum (less than $40,000,) which Richmond has given for five Fairs. The fact is, that gratitude is not a thing to be spoken of at all in this connection. The Railroads of the State built up the Society and have continued to keep it up at certainly no profit to themselves. They alone can claim gratitude, and they have ours. With Richmond it has been, or it ought to have been, a question of policy; if it has not been, the Council have erred, for they were not elected to earn gratitude of any body.

We do not blame the Council for having cast off the State Agricultural Society; and they should not blame the Executive Committee for having gone elsewhere. If the Society have proved a bad bargain to them they ought not to renew it; and they must decide that question for themselves. We certainly regret that they have not thought the Society worthy of their continued support; that they estimate so lightly the advantage to both classes of an annual renewal of good offices and friendly greetings. But that is their affair as much as ours, and they were entitled to decide. But we beg to enter a protest against the claim that they have been excessively liberal. The annual payments show that about five thousand members of the Society have come to Richmond annually. Probably as many, not members, also come. This aggregate cannot spend on their visits less than ten dollars each, or about $100,000. About 20 per cent of this, or $20,000, is the clear gain of Richmond. She offers $1,000 a year for a continuance of this. Now, as she gets the difference, $19,000, we think the boot of gratitude is on the other leg; for in the matter of expenditure the contribution of the country is to the contribution of the city as one to twenty! But this is a low estimate, and the probability is that the relative expenditure of liberal town and ungrateful country is as one to thirty!

In the matter of liberality then, we plead offsetts and claim a balance. We say this in no unfriendly feeling, but to put things right.

We avow that we would rather hold the Fair in Richmond than anywhere else, and we assert the kindest feelings towards Richmond unaffected by this refusal. We hope she will take the explanation as made in candour and good feeling, without a particle of spleen. We regret the step for her sake as much as our own.

For the rest, we congratulate the Society on having obtained so good a place as Petersburg to hold the next Fair, and on having such staunch allies to the Executive Committee as the corresponding body in the Union Agricultural Society.

The hospitality and public spirit of Petersburg are known to the whole State of Virginia. The worth of the Executive Committee of the Union Agricultural Society is not quite so widely known, but it is equally worthy of acknowledgment from those who do know it; and we feel authorized in the name of the Executive Committee of the State Society to thank them for the courtesy and promptness with which they met and accepted our propositions.

AGRICULTURAL REGISTRY AND AGENCY OFFICE.

The undersigned have associated themselves under the name of **AUGUST & WILLIAMS**, for the purpose of conducting a

General Agricultural Agency Business.

They propose to execute any commissions which the farmers of Virginia and North Carolina may confide to them, and will sell Lands, buy or sell Animals of the various improved breeds, Fertilizers, &c. It is our purpose to keep a Register of all lands and other articles in our hands for sale, which will be open to the inspection of all who may wish to purchase. We will, from time to time, (monthly if necessary,) issue a circular advertisement, containing a brief description, price, location, &c., of all lands entrusted to us. These advertisements will be extensively circulated through Virginia and North Carolina, free of expense to our patrons.

Terms:

Our FEE FOR REGISTERING LANDS will be one-tenth of one per cent. on the value thereof; other articles a FEE of not less than $1, nor more than $5, in proportion to the value of each object; to be paid *invariably in advance.* If employed to make sales on commission, this fee will be deducted from the commission.

Our charge for selling land will be 1 per cent., unless a SPECIAL contract is made by which we are to receive an agreed amount for our services, whether a sale is effected or not; on other articles the usual commission.

When *special advertisements* are ordered, the money for the cost thereof *must accompany the order.*

We respectfully solicit the patronage of all those requiring the services of such an agency, promising to use our best efforts to give satisfaction to all who may employ us.

N. AUGUST,
J. E. WILLIAMS,

RICHMOND, Feb. 1, 1858. ☞ *At the office of the Southern Planter.*

CORN PLANTERS.

I have a supply of Stickney's Corn Planters and Davis Patent Bee Hives with printed directions for using the same.

H. M. SMITH.

Baltimore, Md., March 25th, 1858.

DR. CHARLES BICKELL, *Analytical Chemist, No* 29, *Exchange Building, Baltimore, Md.*

Dear Sir,—You will please inform us at your earliest convenience, your opinion of the compound of De Burg as a crop-grower and fertilizer, and oblige,

Very respectfully yours,
J. J. & F. TURNER.

DR. J. J. & F. TURNER, 42 *Pratt St, Baltimore,*

Gentlemen,—In reply to your letter of this date, I can state that I have for many years past advocated in public papers and at private consultations, the use of a compound containing 5 per cent of ammonia and 45 to 50 per cent of phosphate of lime, as most suitable for application on corn. This is the proportion which is also represented in De Burg. Moreover, there is a regular analytical inspection made of De Burg, which will guarantee to the farmer its uniform composition, as it will secure, at the same time, to the dealer the full quality of an article for which he has to pay the manufacturer.

Signed,
CHARLES BICKELL, Ph. D.
29 Exchange Building, Baltimore, Md.

CHURCH & FLEMING,

Commission Merchants,

AND DEALERS IN

THRESHING MACHINES,
PLOUGHS,
WAGONS,

And all kinds of Agriculiural Implements; also Field and Garden Seeds,

CORNER CARY AND THIRTEENTH STS.,
(Opposite old Columbian Hotel,)

WM. B. CHURCH, }
WM. R. FLEMING, } **Richmond, Va.**

PIGS OF IMPROVED BREED FOR SALE.

I have for sale, to be delivered at weaning time, a good many pigs of improved breed. I have produced it myself from crosses of the Surry (or Suffolk) genuine Berkshire, (Dr. John R. Woods' stock) Irish Grazier, Chester County, no Bone and Duchess. I think them superior hogs of medium size, and for fourteen years they have not had a bad cross among them. I prefer that purchasers should view my brood sows and my boar on my farm, three miles below Richmond I will not sell them in pairs, because the in-and-in-breeding would depreciate the stock at once and cause dissatisfaction, but I will sell in one lot several of the same sex.

Price $5 per head for one, and an agreed price for a larger number. They will be delivered on the Basin or any of the Railroad Depots free of charge. FRANK: G. RUFFIN

Summer Hill, Chesterfield, March, 30. 1858.